

IS THE COAL INDUSTRY WORTH PROTECTING?
AN EXAMINATION OF THE EFFECTS OF COMPETING ADVOCACY
COALITIONS ON IMPLEMENTATION OF THE SURFACE MINING
CONTROL AND RECLAMATION ACT (SMCRA) OF 1977

A Dissertation

by

MICHAEL SEAN PENNINGTON

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2008

Major Subject: Political Science

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Approved by:

Chair of Committee,	Kenneth J. Meier
Committee Members,	Robert Harmel
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ABSTRACT

Is the Coal Industry Worth Protecting? An Examination of the Effects of Competing Advocacy Coalitions on Implementation of the Surface Mining Control and Reclamation Act (SMCRA) of 1977. (May 2008)

Michael Sean Pennington, B.A., West Virginia State College; M.P.A., West Virginia University

Chair of Advisory Committee: Dr. Kenneth J. Meier

Harold Lasswell (1936) defined politics as the exploration of “who gets what, when, and how.” As such, one of the central concerns of democratic governance is the role that affected interests play not only in politics, but in the implementation of adopted policies as well. In this dissertation, I use both comparative method case studies, as well as pooled-time series statistical techniques, to examine the effects of political, economic and market forces, and competition between the affected interests on implementation of the Surface Mining Control and Reclamation Act of 1977. The findings of this, as well as previous, research shows that state-level implementing agencies have some discretion in enforcement activities; however, closer examination shows that this discretion is rarely used. This lack of use of regulatory discretion by the state-level implementing agencies suggests that in most states, there is either sufficient competition between the affected interests to neutralize the excessive use of discretion in enforcement activity, or that there is insufficient pressure placed on the implementing agencies by the affected interests to warrant the use of discretion.

DEDICATION

To the loving memory of James Paul Pennington, my big brother.

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At the end of a process as long as the completion of the dissertation—and in my case that happened to be a very long time—it becomes clear that it would not have been possible without the support, guidance, and patience of many people. In my case, the list of people who have contributed to this process seems almost endless, but I will try to shorten the list a bit, in an effort to not let my acknowledgements be the longest section of my dissertation. It is almost certain, that there are people who should be thanked, that will be left from the list, and for that I apologize.

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TABLE OF CONTENTS

	Page
ABSTRACT.....	iii
DEDICATION.....	iv
ACKNOWLEDGEMENTS.....	v
TABLE OF CONTENTS.....	viii
LIST OF TABLES.....	xi
 CHAPTER	
I INTRODUCTION.....	1
Public and Regulatory Policy.....	2
The Coal Industry.....	6
The Surface Mining Control and Reclamation Act of 1977.....	11
Five Questions Regarding the Implementation of the SMCRA.....	13
Organization of This Dissertation.....	33
II OUR FIVE QUESTIONS ADDRESSED IN THE EXISTING LITERATURE.....	35
Is There Discretion Present in the Implementation of Federal Regulatory Programs?.....	36
How Does Federalism Affect the Amount of Discretion Used in Implementation of the SMCRA?.....	40
How Do Political Factors at Both the State and National Level Affect Implementation of the SMCRA?.....	45
How Do Economic and Market Forces Affect Implementation of the SMCRA?.....	54
How Does Competition Among the Affected Interests within the Policy Arena Affect Implementation of the SMCRA?.....	58

CHAPTER		Page
III	RESEARCH DESIGN.....	66
	Methods of Inquiry.....	66
	Data.....	76
	Hypotheses.....	77
	The Dependent Variables.....	82
	The Independent Variables.....	85
IV	COMPARATIVE METHOD ANALYSIS OF SMCRA ENFORCEMENT	95
	Method	96
	Is There Discretion Present in SMCRA Enforcement?....	101
	The Effect of Political Factors on Variation in Enforcement Activities.....	108
	The Effect of Economic and Market Forces on Enforcement Activities.....	111
	The Effect of Competition within the Policy Arena on Enforcement Activities.....	114
	Statistical Control.....	117
V	POOLED TIME SERIES ANALYSIS OF SMCRA ENFORCEMENT	120
	Method.....	121
	Enforcement Activities	123
	Political Factors Affecting Implementation	131
	Economic and Market Forces Affecting Implementation.....	133
	The Effect of Competition Among the Competing Interests on Implementation.....	135
	Statistical Control	138
VI	CONCLUSIONS.....	141
	Is There Discretion Present in Implementing Agency Action?	141
	What Is the Effect of Federalism on State Level Implementation of the SMCRA?	144
	How Do Political Forces Affect State-Level Implementation of the SMCRA?	145
	How Do Economic Factors Affect State-Level Implementation of the SMCRA?	147

	Page
How Does Participation Affect State-Level Implementation of the SMCRA?	149
Conclusions and Implications for Future Research	152
REFERENCES.....	158
VITA.....	167

LIST OF TABLES

TABLE		Page
3.1	Descriptive Statistics.....	93
4.1	Regional Variation in Enforcement Activities-Complete.....	103
4.2	Regional Variation in Enforcement Activities-Selected.....	104
4.3	Intra-Regional Variation in Enforcement Activities-Eastern Region.....	106
4.4	Intra-Regional Variation in Enforcement Activities-Western Region.....	108
4.5	Intra-Regional Variation in the Effect of Political Factors on Enforcement Activities.....	110
4.6	Intra-Regional Variation in Effect of Economic and Market Forces.....	112
4.7	Intra-Regional Variation in Effect of Competition within the Policy Arena.....	116
4.8	Intra-Regional Variation in the Method of Extraction.....	118
5.1	The Effect of the Variables of Interest on Inspections Completed Per Mine.....	124
5.2	The Effect of the Variables of Interest on Notices of Violation Issued Per Mine.....	125
5.3	The Effect of the Variables of Interest on Notices of Violation Issued Per Mine, Including the Effect of Inspections Per Mine.....	126
5.4	The Effect of the Variables of Interest on Notices of Violation Issued Per Inspection.....	127
5.5	The Effect of the Variables of Interest on Cessation Orders Issued Per Mine.....	128

TABLE		Page
5.6	The Effect of the Variables of Interest on Cessation Orders Issued Per Mine, Including the Effect of Inspections Per Mine and Notices of Violation Per Mine.....	130

CHAPTER I

INTRODUCTION

In August 1977, President Jimmy Carter signed into law the Surface Mining Control and Reclamation Act (henceforth referred to as the SMCRA). The SMCRA is seen by many observers of environmental legislation as one of the most important and highly conflictual pieces of regulatory legislation passed during the 1960s and 1970s—a period that witnessed the introduction of a new type of regulatory policy, later referred to as the “new social regulation.” The SMCRA is of interest to political scientists first and foremost because it provides a solid test case not only of public policy implementation, but it also incorporates elements of regulatory policy in general, and environmental and energy policies more specifically. As such, it allows us to examine how specific types of policy react to changes in the policy environment. Beyond that, our interest in the SMCRA, in terms of being a subject worthy of study, lies in the fact that it addresses five key questions concerning politics and public policy in America. The questions that will be addressed in this dissertation are as follows. Is there discretion present in the implementation of federal regulatory programs? If there is discretion present, how does federalism affect the amount of discretion available? How do political factors, both at the state and national level affect implementation? How do economic factors surrounding the regulated industry affect the implementation of policies which seek to

This dissertation follows the style and format of the *American Journal of Political Science*.

regulate said industry? And lastly, how does competition among competing interests within the policy arena affect implementation of regulatory programs? In the pages which comprise the rest of this dissertation, I will seek to shed some light on the answers to these questions regarding state-level implementation of federal regulatory programs. However, before that begins, I feel that some introduction to the notions of public policy generally—and regulatory policy specifically—as well as to the coal industry are in order.

Public and Regulatory Policy

The intriguing thing about regulatory policies is that by definition they are a subset of the larger phenomenon of public policy as a whole. Therefore any discussion of regulatory policy should begin with some idea of what constitutes public policy. The answer to this question is not as easy as one might presume.

Some definitions of public policy are centered on the notion that public policy is rooted in some purposive action on behalf of some actors of consequence. Examples of this type of definition include those by James E. Anderson (1997) and Clark E. Cochran, et al (1990). Anderson defines public policy as “a relatively stable, purposive course of action followed by an actor or set of actors in dealing with a problem or matter of concern” (1997: 9). Anderson’s definition is important in that it focuses its attention on what is actually done in the course of public policy, not simply on what is proposed or intended. Furthermore, Anderson (1997: 9) notes, “it differentiates policy from a decision, which is essentially a choice among competing alternatives.” Cochran et al

follow suit by defining public policy as “an intentional course of action followed by a government institution or official for resolving an issue of public concern” (1990: 2). The troubling part of these definitions for some scholars is their focus on “purposive action.”

Some scholars feel that intentions are hard—if not impossible—to measure, and that any definition of public policy that begins with the assumption that one knows what was intended is flawed. Following this line of thinking, Thomas Dye provides us with this competing definition of public policy, “public policy is whatever governments choose to do or not to do” (1992: 4). This rather minimalist definition can be attributed to the fact that Dye feels that “we can never be sure whether or not a particular action has a goal, or if it does, what that goal is...All we can really observe is what governments choose to do or not to do” (1992: 3). While it is true that we as impartial observers are unable to know precisely what is intended by agency action, or even by the formation of certain policies, we must not allow ourselves to become cynical to the point to where we believe that all government action is due to simple happenstance. If we believe that this is the case, then how can we endeavor to study, and presumably learn, about public policy? The notion that public policy is devoid of intention is somewhat non-sensical in application. Surely there is some manner of intention involved in the formulation of public policy, whether we are perfectly aware of these intentions or not. In fact, the use of the word “choose” in Dye’s own definition implies that at the base of public policy lies intention.

Now that the matter of public policy in general has been addressed, what about regulatory policy in particular. Meier (1985) defines regulatory policy in the following manner. “Regulation is any attempt by the government to control the behavior of citizens, corporations, or subgovernments.” Eisner, Worsham, and Ringquist believe that this definition of regulation is inadequate because it seems to be too inclusive. They argue that all public policy at some level is designed to “coerce certain patterns of behavior.” This concept is based upon a general interpretation of the term “coerce.” Eisner et al’s interpretation of the term “coerce,” includes any type of government action which is aimed at curbing behavior, and is not limited to those actions which involve forceful coercion. By this broad definition coercion can include the provision of incentives and subsidies as well as the provision of information through signaling. In light of this expanded definition of coercion, along with their perception of the shortcoming of Meier’s definition, they provide the following definition of regulation. “Regulation will be used to describe an array of public policies explicitly designed to govern economic activity and its consequences at the level of the industry, firm, or individual unit of activity” (Eisner et al 2000: 4). The authors note that by using this definition of regulation, they are not concerned with policies that affect economic activity at the macroeconomic level, but are instead concerned with policies that affect the microeconomic level of activity.

Much of the regulatory activity which took place during the Progressive and New Deal eras was simple macro-economic regulation. This type of regulation tends to be concerned with the conditions under which firms can enter and leave the market, matters

of fair competition, and price controls. As noted earlier, the emergence of the 1960's witnessed the growth of a new type of economic regulation, that which has been described as the "new social regulation." The "new social regulation" took more of a microeconomic view of the regulatory process, by ensuring that the needs of individual actors were not ignored. The result of this expanded view of the proper role of regulation allowed the federal government to address such economic and social ills as racial inequality, unsafe workplaces, and environmental irresponsibility. The type of regulation being discussed in this dissertation—the environmental regulation of the effects of surface coal mining—clearly falls under the purview of the new social regulation.

With the great deal of diversity present within the field of regulatory politics, there are several answers to the question of why governments regulate. While the rationales for regulatory policy can probably equal the number of regulatory agencies, Eisner, et al limit their discussion to five possible explanations:

1. Regulations are public policies designed to further the "public interest"
2. Regulations constitute efforts to prevent or compensate for market failure
3. Regulations are the product of industry demands for wealth transfers
4. Regulations are the product of agencies captured by regulated industries
5. Regulations are the product of competing regional political economies

This list does not exhaust all possible reasons for governmental regulation, nor are the explanations listed above mutually exclusive. In deed there may be some reasons for governmental regulation that do not fall neatly into one of the above categories, and

some forms of governmental regulation may fall into more than one. However, this list does provide a useful starting point in the examination of regulatory policy in the United States.

The type of regulation that is the focus of this dissertation clearly lies within the first two categories listed above. The regulation of strip mining and the subsequent reclamation of abandoned mine lands clearly serves the “public interest” by forcing industry to clean up not only what they mess up today, but it also addresses the market failures of the past by forcing that the coal industry to take responsibility for past neglect.

The Coal Industry

The coal industry is, and has been throughout its history, a dirty business both literally and figuratively. During the early part of this century, the majority of coal production came from a mining technique known as deep mining. In deep mining, a tunnel (or shaft) is drilled deep into the surface of the earth, and miners then go in and extract the coal. Deep mining is the notion that most of us have concerning the coal mining industry; a picture of the coal miner complete with miners cap, covered in coal dust, emerging from the mine at the end of a long days work. The problem with deep mining is that it is very expensive and dangerous work. Furthermore, this type of mining is not very efficient. In order to maintain the structural integrity of the mines there must be proper reinforcement of the roof systems within them. In order to accomplish this goal, much of the usable coal must be left behind to provide support for the mine.

Despite the technological advancements that have been made in the extraction of coal from deep mines—such as longwall mining—it still remains an expensive and inefficient method of coal extraction.

In order to address many of these difficulties, the coal industry has moved most of its production to another method of coal extraction, commonly referred to as “strip mining.” The move from deep shaft mining to surface mining is clearly an important technological advancement in terms of this study because the policy being evaluated is the Surface Mining Control and Reclamation Act. However, this is not the only technological advancement which has an effect on implementation of the SMCRA. Changes in productivity can affect workforce, which can in turn affect the number of people who are concerned with policy formation and implementation. The fewer people that are employed by the coal industry, the fewer people that are potentially affected by the costs of implementation to the regulated industry. In addition to technological advancements, market forces can also have a large impact on the implementation of any federal regulatory program. This notion leads to the second reason for studying implementation of the SMCRA. In the nearly twenty-five years since the introduction of the SMCRA, there have been many changes not only in the technology used to extract coal but also in the market forces that affect coal industry profits.

Strip mining, the surface mining of coal, while providing the coal industry with an efficient and relatively safe method of coal extraction can be ugly. The unregulated surface mining of coal can be destructive to the environment. Surface mining leads to erosion of land and siltation, produces toxic and acidic runoff which can pollute not only

local water systems but all water systems that are connected, and can even cause flooding. Beyond these concerns, surface mining generally takes place in remote, rural areas which are the natural habitat for much of our fish and wildlife. The negative effects of surface mining contribute to the destruction of fish and wildlife, and diminishes natural beauty in these areas. However, the surface mining of coal does not affect all areas in the same way. This contention leads us to our second question for examining the SMCRA, the effects of federalism and state level influence on implementation. As Desai (1993; 6) notes, “there are significant regional variations in the adverse environmental consequences of surface mining, depending on the terrain, the hydrology, and the geological, biological, and chemical conditions of the mined area and upon the climate of the region.”

Historically, much of the nation’s coal production comes from the Appalachian mountain region; and while this region still relies heavily on deep mining, there is an abundance of surface mining which takes place in the area. This region is defined by some rather steep, mountainous terrain. In this region, heavy rainfall in areas affected by surface mining erodes soil banks and fill areas, producing mudslides and sedimentation. This high level of sedimentation affects the water supply in two significant ways. Not only is the water system polluted by the toxic and acidic runoff produced by this type of mining, endangering fish and wildlife, but the sedimentation can also produce excessive amounts of flooding.

The problems caused by surface mining in the Midwestern states are somewhat different due largely to the difference in topography. The Midwestern coal producing

states are relatively flat, so mudslides and valley fills are not as much of a concern. The Midwest is a very important region, not so much in terms of coal production, but in terms of agricultural production. In the Midwest the problem with surface mining is mainly the destruction of prime farmland and pollution of the water system through acid mine runoff. The main damage to farmland caused by the surface mining of coal in the Midwest is the mixing of the higher quality topsoil with minerals which are found in the lesser quality, lower soil horizons. This mixing of the soil causes it to lose much of its productivity. This is clearly a serious problem considering the sheer agricultural output of the area and the number of people—both here and abroad—who are dependent upon that output.

In the Western region, the problem with surface mining centers around its polluting of the water supply. The Western region of the United States receives a relatively low amount of annual rainfall; and, therefore, it is heavily dependent on its natural aquifers and groundwater. Pollution of the drinking water supply in this region is not the only problem associated with the surface mining of coal. The environmental damage caused by surface mining in this region is magnified by the inability of semiarid ecosystems, like the one found in the western United States, to recover environmentally.

By the early 1970s there was an abundance of evidence supporting the claims of the harmful effects of surface mining on the environment. More than four million acres of land in the United States had been adversely affected by the surface mining of coal (Desai 1993). This evidence was presented to Congress by coal state citizen groups, the growing environmental movement, and others as proof of the need for strong federal

legislation of surface coal mining. These groups argued that the existing levels of state regulation were insufficient to address a problem that was now taking on more of a national scale. Their argument centered on the belief that the surface mining of coal had a large impact on interstate commerce, and as such a strong national policy was needed to level the playing field among coal industries in different states.

Clearly this position was in opposition to the wishes of the coal industry and the states that produce large amounts of coal. Their argument was centered on the point that the states were already regulating the coal industry adequately, and that with time their performance would actually improve. Furthermore, they argued that the vast regional variation in the methods used for coal extraction and their subsequent effects on the environment were sufficient to warrant state control of regulation. In the end, the SMCRA was passed into law and established a set of nationwide standards and a regulatory framework for the control of surface coal mining. However, in concession to the argument that the states were in a better position to regulate the industry—and also due to the financial implications of creating such a large federal bureaucracy— a substantial portion of implementation was left in the hands of state agencies. This fact reinforces our interest in the subject of surface mine regulation due to the effects of federalism on such a large federal regulatory policy. This will also have important implications on the types of political and economic variables that we will expect to have an affect on implementation of the act.

The Surface Mining Control and Reclamation Act of 1977

The late 1960s and early 1970s were a time which saw a great deal of change in regulatory policy in the United States. This era witnessed a dramatic growth in the number of regulatory agencies that sought to protect the American public from perceived evils, evils that ranged from unsafe workplaces to industrial neglect of the environment. The new regulatory agencies were a departure from earlier regulatory agencies in that their aim was not focused on the traditional “market oversight” role that had dominated regulatory policy, but were instead concerned with righting social and economic ills such as providing for equal rights, providing safe workplaces, and cleaning up the environment. This shift from the traditional roles of regulatory agencies is often referred to as the “new social regulation.” As defined, the new social regulation is designed to “force corporations to accept greater responsibility for the safety and health of workers and consumers, as well as for the negative by products of the productions process” (Eisner et al 2000: 5).

Without question, the Surface Mining Control and Reclamation Act of 1977 was one in a number of these new regulatory policies. At the time of its passage, the SMCRA was a “highly detailed, complex statute” which sought to regulate the entire coal industry to an extent that had not previously been witnessed in the United States (McElfish and Beier, 1990). The following account, taken from the opening section of the SMCRA helps to explain why such drastic means were deemed necessary:

Many surface mine operations result in disturbances of surface areas that burden and adversely affect commerce and the public welfare by destroying or diminishing the

utility of land for commercial, industrial, residential, recreational, agricultural, and forestry purposes, by causing erosion and landslides, by contributing to floods, by polluting the water, by destroying fish and wildlife habitats, by impairing natural beauty, by damaging the property of citizens, by creating hazards dangerous to life and property by degrading the quality of life in communities, and by counteracting governmental programs and efforts to conserve soil, water, and other natural resources.

Evidence of the severity of the conditions described in the above statement were exemplified by the 1972 Buffalo Creek flood disaster in West Virginia. The Buffalo Creek flood was caused by the collapse of a coal refuse dam created during a surface mine project. The subsequent flood destroyed more than 1000 homes and caused the death of 125 people. Clearly, some sort of government action was needed to ensure that such a disaster would not happen again. The protective regulatory policies that are part of the “new social regulation,” such as the SMCRA, present implementing agencies with a significant number of problems. As McElfish and Beier (1990: xv) note, “the enactment of environmental laws is only the first step in the process of environmental protection. Implementation is frequently a far more difficult task.”

Protective regulatory policies are different from other types of public policy in that the affected interests (industry) have absolutely nothing to gain and plenty to lose. In this type of situation, the targeted group generally resists the proposed changes of the regulatory agencies vehemently (Ripley and Franklin, 1986). In light of the opposition that they are sure to face, implementing agents typically are required to exert a great deal of effort to ensure that the protective policies achieve their desired effect. Noting this difficulty in achieving policy goals in implementation, it cannot be assumed that the implementing agency will put forth the required effort to make a regulatory policy a

success (Sabatier and Mazmanian, 1979). Agencies often have difficulty in engendering the implementation effort necessary for successful implementation of the policy in the organization.

Five Questions Regarding the Implementation of the SMCRA

As stated earlier, the relevance of this dissertation in terms of political science research centers around the notion of how implementation of the SMCRA addresses five matters of concern. However, before this conversation can begin, I feel that it is important to address the notion of implementation, and how it will be measured in this dissertation. As Pressman and Wildavsky (1984) illustrate in their seminal work, *Implementation*, the actual process of policy implementation is a complex web of many interrelated tasks. Implementation of regulatory programs covers everything, from securing a literal, physical space to house the implementing agency, to staffing said agency, to establishing rules and procedures for the agency, to determining enforcement procedures, to carrying out said enforcement procedures, to evaluating the effectiveness of implementation and making corrections in future action. No doubt, each of these steps is important in the implementation process.

In this dissertation however, I will limit my examination of implementation to enforcement activities carried out by the implementing agency. In terms of the total process of implementation, this is but the tip of the iceberg, but in terms of the existing literature in the field of regulatory policy implementation (Keiser and Soss, 1998; Scholz and Wood, 1998; Hedge and Scicchitano, 1994; Ringquist, 1993; Wood and Anderson,

1993; Wood 1992; Scholz, Twombly, and Headrick, 1991; Scholz, 1991; Wood, 1990; Thompson and Scicchitano, 1985; Wood, 1991; Langbein and Kerwin; 1985), this is the norm. As such, while noting the limits of relying on enforcement measures as an indicator of overall effectiveness of implementation, I think that in this case, it will capture the substantive effect of implementation desired, the extent to which agency action curbs the behavior of the regulated.

Majone and Wildavsky note that implementation is not a tidy process, but an evolutionary process in which “at each point we must cope with new circumstances that allow us to actualize different potentials in whatever policy ideas we are implementing” (Theodoulou and Cahn, 1995: 150). What causes the implementation process to be so evolutionary? One answer to that question surrounds the notion that public policy in the United States does not exist in a vacuum, but is open influences present within the political environment. Theodoulou and Kofinis state that “the evolution of policy implementation is defined and redefined, in part, because of the constancy of the actors that intervene throughout the course of policy implementation” (2004: 170). This type of assertion leads me to deduce that the key to understanding the “evolutionary” process of policy implementation is to understand participation within the policy arena. With this understanding, there are five questions concerning policy implementation which come to mind.

The first question addressed by this dissertation concerns the amount of discretion available to agency personnel in implementation of the act. Discretion is important because without discretion in action, political influences could cause no

variation in implementation. The question of what is the proper amount of agency discretion is one that is central to the study of public administration. In terms of the amount of discretion made available to agencies charged with implementing regulatory policy, the SMCRA and its “new social regulation” brethren of the 1960s and 1970s demonstrates a shift toward a new administrative philosophy. Eisner (2000: 125) states that this new administrative philosophy was “in many ways an expression of, and a response to, a new growing body of work detailing the failure of past regulatory efforts.” These perceived failings, according to Eisner, centered on two key concepts—organizational structure of the implementing agencies and the nature of the policy process itself.

Much of the Progressive and New Deal regulatory legislation relied on independent regulatory commissions for implementation and enforcement. The rationale for this was that regulatory commission could provide a “unique synthesis of policy expertise, administrative flexibility, and independence” from political control (Eisner 2000: 125). However, this notion came under fire with the publication of Marver Bernstein’s *Regulating Business by Independent Commission* (1955) and its discussion of the notion of agency capture.¹ Bernstein demonstrated the shortcomings of the independent regulatory commission as an organizational form by examining agency performance and concluding that the commissions pass through a “life cycle” of sorts. After the initial stages of gestation and youth—during which the enabling legislation is passed and the agencies are created—the independent regulatory commission enter a

¹ Eisner notes, quite correctly, that the notion of capture theory is also presented effectively in Huntington (1952) “The Marasmus of the ICC.”

period of maturity. Bernstein (1955: 87) notes that in this period “the commission becomes more concerned with the general health of the industry and tries to prevent changes which adversely affect it. Cut off from the mainstream of political life, the commission’s standards of regulation are determined in light of the desires of the industry affected.”

From this stage, the commission eventually declines into “old age.” During this stage “the regulatory interests become so fixed that the agency has no creative force left to mobilize against the regulated groups. Its primary mission is the maintenance of the status quo in the regulated industry and its own position as recognized protector of the industry” (Bernstein 1955: 92). The argument being that independent regulatory commissions are predisposed to agency capture because their “formal independence” (coupled with a lack of interest group participation during the era) insulated them from political influence and allowed their incompetence to go largely unnoticed. Consequently, the only formal contact that they maintained and support that they received came from the very interests that they were created to regulate (Eisner 2000: 126). In response to this organizational structure critique, the majority of regulatory policies during the “new social regulation” era were entrusted to agencies which fell under presidential oversight. The Office of Surface Mining Reclamation and Enforcement—which was established to implement the SMCRA at the federal level—was established within the Department of the Interior.² However, the OSMRE does not hold a monopoly on SMCRA enforcement activities. The SMCRA uses an

² Other examples of this trend were the placement of the Occupational Safety and Health Administration within the Department of Labor, and the establishment of the Environmental Protection Agency as an independent agency.

implementation system that is often referred to as “partial preemption.” Under a partial preemption system, responsibility for implementation and enforcement is shared between federal and state government agencies. Desai (1989a: 67) notes that the effectiveness of this particular implementation system requires a good faith partnership between the federal government and the state governments,” and that there is “perpetual tension” built into the systems design. A further discussion of this tension will be addressed when I examine the affect of federalism on state-level implementation of the SMCRA.

The second critique of Progressive and New Deal era regulation dealt with the nature of the policymaking process itself. The most influential critique of the policymaking process in terms of early regulatory policy was Theodore Lowi’s *The End of Liberalism* (1969). Lowi’s major complaint with early regulatory policymaking was its delegation of authority from Congress to the implementing agencies. Lowi describes the policymaking process based on the delegation of authority as “interest group liberalism.” Lowi sees “interest group liberalism” roughly as a two step process. In the first step, Congress grants de facto authority over regulatory action by passing vague legislation. There are many legitimate reasons for Congress to pass vague legislation—lack of time, lack of political effectiveness, lack of area specific knowledge, etc.—but Lowi sees this delegation of Congressional authority to the bureaucracy as being problematic. In the second step, the implementing agency—bolstered by the concept of liberalism—gives in to the affected interests that dominate the policy arena. Therefore, according to Lowi, when Congress delegates its authority through vague legislation, the

implementing agency tends to create policy that reflects the demands of the affected interests that have gained access to the policymaking process. This type of policymaking is problematic according to Lowi, because it couples unlimited public access to the policymaking process with a political philosophy that champions such access. In doing so, “interest group liberalism” allows private interests to subvert the public good by manipulating policy not at the policy formulation or policy adoption stage, but at the implementation stage and out of the public eye. In an effort to combat the effects of “interest group liberalism” on regulation, most of the environmental statutes passed during the “new social regulation” era were quite specific and prescriptive in nature.

Which leads us back to the question of how much discretion is available in terms of state-level implementation of the SMCRA? Evidence supporting the notion of discretion being present in SMCRA implementation will be presented through an examination of the existing literature on the subject in Chapter II.

The second question addressed in this research examines the effect of federalism on state-level implementation of the SMCRA. The amount of authority that the federal government gives to states in the implementation of its policies is an important factor in quality of implementation. This being noted, the decision to delegate primacy to the states in policy implementation is not one which is taken lightly. The amount of authority given to the states in implementation is often a product of when, and most importantly during whose administration the policy is enacted. During the civil rights reform period of the 1960’s, the states were seen as enemies of the federal government

in policy implementation. During this time, President Johnson relied on a tactic which was referred to as “creative federalism.” The main tenant of creative federalism was to empower the local governments to implement policy through categorical grant in aid programs, which carried with them strict guidelines from the federal government.

However, when it was time to implement the SMCRA, there was a new administration in place, and new beliefs on the best way to implement federal policy. Starting with Nixon, but certainly continuing through Carter and Reagan, the best perceived notion of policy implementation involved a process called “cooperative federalism.” Under the auspices of cooperative federalism, much of the authority, along with much of the cost, of implementing federal programs was given to the states. The attractiveness of this style of policy implementation lies not only in the cost savings to the federal government, but also in the belief that those within specific states know best how to regulate industry within that state. However, this system can lead to inaction, or even worse, corruption.

In spite of the problems involved in relying on state agencies to implement new government programs, many of the environmental protective regulatory policies enacted in the 1970’s entrusted implementation to the states. Examples of this trend are the Clean Air Act amendments, the Water Quality Act, and the SMCRA, all of which assign significant authority in policy implementation to the states (U.S. Advisory Commission on Intergovernmental Regulation, 1984). During legislative oversight hearings geared at reviewing the implementation processes of the SMCRA, Representative John Seiberling of Ohio noted that:

...the concept of this Act is that the states will implement the strip mining laws, and particularly the provisions of the Act, but that it is, in the end, the responsibility of the Secretary³ to see that they do.⁴

This choice, to entrust the implementation of the SMCRA to state agencies seems to be particularly strange in light of the specific circumstances which led to the SMCRA being enacted. The specific problem was that the federal statute was enacted because all state programs aimed at regulating surface mining were deemed to be failures. Although stated more positively in the Act itself, Congress' disapproval of the states' implementation of mining regulation is apparent in the legislative history which accompanied the Act:

Despite claims from some quarters that State reclamation laws have improved so significantly that Federal mining standards are no longer needed, the hearing record abounds with evidence that this is simply not the case. For a variety of reasons, including the reluctance of the State to impose stringent controls on its own industry, serious abuses continue.

Given the very matter-of-fact method in which the federal government denounced the states attempts at regulation, and the rather remedial nature of the legislation, there is no doubt that this legislation was the cause for some very hard feelings. Dale Russakoff, a journalist for the *Washington Post*, noted in his June 7, 1982 article that:

...the new law did to the coal states what the Civil Rights Act in its early years did to the South. It declared that the states had failed to protect their citizens, in this case from the ravages of strip mining. And it yanked away local control, in this case over the coalfields, until state laws were brought up to federal standards.

³ The Office of Surface Mining Reclamation and Enforcement falls under the supervision of the Dept. of the Interior. Therefore, the "Secretary" that is mentioned in this quotation is referring to the Secretary of the Interior.

⁴ John F. Seiberling, Oversight Hearings, No. 97-35, at 111 (September 9-10, 1982).

In spite of this, the responsibility for implementing the SMCRA was given to the states—under the supervision of the Office of Surface Mining Reclamation and Enforcement (Hence referred to as the Office of Surface Mining or the OSMRE) at the federal level. A former West Virginia state regulatory attorney in an article in the West Virginia Law Review noted this apparent gaff on behalf of the federal government in 1979:

The Act is founded on a paradox. On the one hand, it was enacted because of the disastrous consequences resulting from the historic failure of the states to regulate coal mining effectively. On the other hand, it expressly confers upon the states the primary responsibility for its administration and enforcement.⁵

Despite the apparent problems involved with allowing states to implement federal regulatory policy, the federal government still relies heavily on the states to achieve their regulatory objectives. The reasons for this are not immediately clear; however, one possible answer is based largely in the same reasoning that placed the standards of the Federalist system into the Constitution in the first place; fear of a large, strong, central government. For their part, states insist on minimal federal oversight, citing “primacy”, federalism, state experience in policy implementation, and state staffing of regulatory agencies as reasons (McElfish and Beier, 1990). The Federal government is willing to go along with this because of the large expense involved in establishing adequate staff and resources for effective policy implementation from top to bottom.

⁵. Rochow, “The Far Side of Paradox: State Regulation of the Environmental Effects of Coal Mining”, West Virginia Law Review 559, 1979.

While this certainly covers the rationale behind the use of cooperative federalism in implementation of federal regulatory programs, it does not cover the amount of discretion available to the state-level implementing agencies. Under the regulatory strategy of “partial preemption,” the federal government establishes a baseline of regulatory enforcement. The states then are required to establish their own programs, which are then reviewed and subsequently approved by the federal government agency before states are granted “primacy.” In order to meet the federal government’s requirements to achieve “primacy”, states typically write their regulatory standards very close to the mandated enforcement minimums. In doing so, they can achieve “primacy” quickly, and still leave open the possibility of enforcing at a higher level.

In this circumstance, the amount of actual discretion available in state-level implementation of federal regulatory programs can be highly variable. For example, if the implementation standards set by the federal government are considered to be stringent standards, then it is unlikely that there will be much state-level variation. In this instance, states would not be likely to enforce at a level below that mandated by the federal standards for fear that the federal government would assume regulatory authority under “partial preemption.” However, if the federal standards for enforcement activity are not particularly stringent, then state-level implementing agencies have more discretion in terms of enforcement, due to the possibility of enforcing above and beyond the standards set by the federal government. State-level enforcement of the SMCRA seems to be an illustration of the latter. The federal standards in terms of SMCRA enforcement do not seem to be particularly stringent. The federal statute mandates that

states perform a specific number of inspections per mine. That number has changed over time from a low of two inspections per mine per year, to the current high of twelve inspections per mine per year. A review of the available data shows that all states easily meet this standard in terms of enforcement. Therefore, the discretion available to the state-level implementing agencies lies in how far above the federal mandate they choose to enforce.

The third question addressed in this research deals with the effects of political actors on the implementation of the SMCRA. Because the SMCRA relies on a system of “partial preemption” and cooperation between federal and state government agencies, there is an opportunity for political actors at both the national and state level to influence regulation. This being noted an examination of political actors at both the national and state level, and how they can influence implementation is in order.

At the national level, the main political actors which can affect implementation are the president, Congress, and the courts. In terms of presidential influence, the president has at their control, three tools for affecting implementation—appointment power, budgetary authority, and organizational and management reforms. The first, and perhaps most effective form of control is that of appointment power. Theodoulou and Kofinis (2004: 174) note that “as chief executive, the president has the power to appoint a series of officials from heads of agencies to undersecretaries and deputy undersecretaries. Such appointments represent the desire of every president to control the method of policy implementation.” The underlying logic being that the president can

appoint likeminded people to implement policy in a manner consistent with presidential intentions (Wood and Waterman 1994).

The second tool available for presidential control, that of budgetary authority is also a potentially powerful tool in affecting implementation. While the president does not enjoy sole budgetary authority—the president prepares the formal budget proposal while it is the responsibility of the Congress to actually pass into law the budget—presidential influence can still be felt. The federal budget as presented by the president represents the fiscal framework for how funding will be allocated to specific departments, agencies and programs. Therefore, the president can influence agency action by providing them with more or less money with which to complete their programs. Whether or not you think that this affects agency action by actually constraining their resources, or by simply sending a signal to the agency that demonstrates how pleased the administration is with their actions, the end result is the same.

The third tool available to the president in influencing agency action is through organizational and management initiatives. Specifically, the entire bureaucracy or individual agencies may be reorganized in an effort to “alter the method and conditions by which bureaucracies function and implement policy decisions” (Theodoulou and Kofinis 2004: 176). However, this type of action currently requires an enormous amount of effort and support, and is generally only used in extreme circumstances—such as the

establishment of the Department of Homeland Security in the wake of the September 11, 2001 terrorist attacks on the United States.⁶

In addition to the president, bureaucratic behavior can also be affected through Congressional action. The Congress has essentially two tools at its disposal in affecting implementation of policy after the enabling legislation is passed. As noted earlier, the role of budgetary authority is one that the president shares with the Congress. The president presents the annual budget proposal to Congress, and then Congress determines the appropriations accorded to each agency, program, and service. Much like the president, members of Congress can signal intentions to the bureaucracy through budgetary appropriations. The second tool available to the Congress in influencing bureaucratic action is through its oversight function. While the bureaucracy is constitutionally seen as an extension of the president and the executive branch, Fessler and Kettl (1996:114) note that “overseeing the bureaucracy is...as much a congressional prerogative as an executive one.” The problem with Congressional oversight is that it is somewhat randomly used.

McCubbins and Schwartz describe Congressional oversight policy as being concerned with “to what extent and in what way Congress attempts to detect and remedy violations of legislative goals” (1987: 426). They go on to argue that oversight normally

⁶ While it is the case that it is currently much more difficult for the President to control the bureaucracy through the use of reorganization, that has not always been the case. William F. West (1995: 80) notes that “the function of creating, abolishing, combining, and defining the duties of government agencies was exercised exclusively through statutory law until 1932, when Congress first delegated broad reorganization authority to the executive.” However, “presidential authority to create or abolish cabinet-level departments was taken away in 1964. Power to reorganize independent agencies was originally given to the president, rescinded in 1939, reinstated in 1949, and rescinded again in 1977.” For a more elaborate discussion of these events, see Peri E. Arnold, *Making the Managerial Presidency: Comprehensive Reorganization Planning 1905-1996*, 2nd Edition (Lawrence: University of Kansas Press, 1998).

takes on one of two forms, “police patrol” oversight and “fire alarm” oversight. “Police patrol” oversight is described as being “comparatively centralized, active, and direct: at its own initiative, Congress examines a sample of executive agency activities with the aim of detecting and remedying any violations of legislative goals.” “Fire alarm” oversight, on the other hand, is characterized by “less active and direct intervention” on the part of Congress (McCubbins and Schwartz 1987: 247). Under “fire alarm” oversight, Congress “establishes a system of rules, procedures, and informal practices that enable individual citizens and organized interest groups to examine administrative decisions, to charge executive agencies with violating congressional goals, and to seek remedies from agencies, courts, and Congress itself” (Siavelis 2000: 1). Of the two models listed above, Congressional oversight tends to follow more of a “fire alarm” than a “police patrol” model—meaning that it is often used only after a serious problem occurs.

The third national political actor to influence implementation is the courts. Theodoulou and Kofinis (2004:177) state that “the role of the courts provides a legal basis by which citizen activists, interest groups, or state and local governments can attempt to effectively regulate the regulators.” Traditionally the courts have been able to influence bureaucratic action through the judicial review of both rulemaking and judicial decisions provided in the Administrative Procedures Act. The influence of the courts was further strengthened during the era of “new social regulation.” As Eisner (2000: 129) points out, the environmental legislation passed during this time “granted citizens standing to sue the agency for failing to fulfill its mandate.” As a result, the court could

increase its influence in terms of agency action because there was a greater likelihood that legal action would be brought in a case of regulatory inaction.

Now that the possible political influences at the national level have been reviewed, how effective are their tools likely to be? Well, as Wood and Waterman (1994) note, bureaucracies have a difficult time insulating themselves from political influence when the powers that be want to take action. However, since the purpose of this dissertation is to examine factors which can lead to variation in state level implementation of the SMCRA, these influences are not likely to produce much in the way of results. The expectation being that national level influences would affect each of the states in a similar fashion, therefore it should not cause interstate variation. What is much more likely to cause interstate variation is the influence of state level political factors.

While it is noted that powerful individuals within state government are likely to have a disproportionate amount of influence, such influence is very difficult to quantify. Therefore, the best indicator of state-level political influence on bureaucratic action is likely to be a measure of state-level political ideology. The utility of such an ideology indicator is based upon the underlying assumption that “democracy requires a strong correspondence between popular preferences, the ideological orientations of elected representatives, and government policies” (Berry et al 1998: 327). In terms of how these factors might influence state-level implementation of a federal regulatory program like the SMCRA, the conventional wisdom is based on the following logic. The first step in the process is to assume that the preferences of the voting public are reflected in the

ideological make-up of state government. Despite the fact that the correlation between citizen preferences and state government action is a matter of some contention in the political science literature, it is an assumption that I am willing to make. The next step in the process is to assume that state-level political actors will not only have a desire to influence state-level bureaucratic decisions, but the ability to do so as well. Since implementation of the SMCRA uses an implementation model based on “partial preemption,” where a good deal of implementation authority is devolved to the states, this seems to be a reasonable assumption as well. Thirdly, if the ideological make-up of state government reflects the will of the people, and if bureaucratic action reflects the will of state government, then policy decisions in terms of state-level implementation should reflect citizen’s ideological preferences. This being noted, a measure of state-level government ideology should reflect citizen’s preferences in terms of policy implementation. The extent to which these preferences vary should provide us with some indication as to how much variation we should expect in terms of enforcement activities related to the SMCRA. If enforcement activities covary with the political ideology of the government in the respective states, then we can reasonably assume that political influences within the state have an influence of implementation. If they do not, then we cannot assume that state-level political forces have influenced implementation in any significant way.

The fourth question explored in this dissertation regards the economic factors that affect the implementation of the Surface Mining Control and Reclamation Act of 1977. In terms of economic factors which might impact implementation, this

dissertation is a test of two traditional, but contrasting, political economy models of regulation. The first hypothesis states that “the higher the profits in an industry, the more likely that regulation will benefit the nonregulated” (Meier 1985: 301). A logical extension of this hypothesis would predict that as an industry becomes troubled, implementation of regulatory policy can be lessened to ease the burden that the industry is facing. The second hypothesis states “the more substitutes there are available for the industry’s product, the more likely that regulation will benefit the nonregulated” (Meier 1985: 301). While these theories are not diametrically opposed to one another in theory, in practice one can work against the other. A further discussion of these theories, and the logic behind them will be presented in Chapter II.

A major focus of this research is to determine how these general theories of regulation affect the implementation of a specific act such as the SMCRA. In terms of the first hypothesis stated above, the profit margin of the coal industry over the time period of this study (1978-1997) has changed dramatically. When the act was first implemented (1978), the United States was emerging from an energy crisis with high coal prices. In the years since the passage of the SMCRA however, the price of coal has fallen consistently from year to year. Since the coal industry is not as profitable as it once was and since profits are clearly in decline, then (according to the first hypothesis) the regulation should benefit the regulated interest, or in this instance, the coal industry. Application of the second traditional hypothesis concerning economic regulation to my specific case produces the following assertions. A substantial reason for the drop in the price of coal over the last twenty years is the ready availability of other sources of

energy. This abundance of alternate energy sources, placed in perspective of the second hypothesis, would cause one to conclude that regulation in this case would benefit the nonregulated, or in this case the environmental lobby. Clearly in the case of implementation of the SMCRA, these hypotheses are in opposition to one another. However, simple variation in economic resources available to the affected interests does not tell the whole story.

In addition to this application of traditional economic regulatory theory to the implementation of the SMCRA, Meier (1988, 29) states that “four key actors have been identified as influencing regulatory policy—industry groups, consumer groups, the regulatory agency, and political elites.” The relative strengths and priorities of each of these key actors, in terms of surface mine regulation, has changed substantially since the passage of the SMCRA. Specifically, the mining industry has lost much of its political and economic clout while the environmental lobby has gained in influence of this time period, a matter that will be discussed in the next section. The environmental lobby therefore, is in a much better position to influence regulation in the area of surface coal mining than the coal industry. This assertion leads to the final question of concern in this dissertation. How does competition within the policy arena affect the implementation of the SMCRA?

The fifth question, the affect of participation on public policy is addressed variously in the literature. It doesn’t really matter whether you believe that public policy is created and implemented by political elites, within cozy iron triangles, or policy whirlpools, or within issue networks, or policy communities, or advocacy coalitions; or

whether you believe that participation in these groups is dependent upon political status, the dispersion of costs and benefits, or the result of varying levels of salience and technical complexity, one thing is clear. Public policy and its resultant implementation is certainly the product of cooperation and competition amongst the affected interests within the policy arena. The matters of concern in this dissertation are what causes the power equilibrium between these interests to fluctuate, and what is the affect of this variation in power on policy implementation?

As for what causes the power equilibrium to fluctuate between the interests which comprise the surface mine policy arena, the answer might be a function of participation. Not just the quantity of participation, but the quality of participation as well. Several policy studies look at the factors which affect participation in the policy arena. Wilson (1980) contributes both the quantity and quality of participation in policy implementation to variation between the costs and benefits of the policy, and who must bear those costs or receive those benefits. Gormley (1986) produces similar results in trying to explain participation in the policymaking arena, but does so by attributing variation to the concepts of salience and complexity. The utility of each of these models is that they help to explain not only who is involved in the policymaking arena, but the extent to which they are involved, and why they are involved. However, perhaps the most useful framework in terms of understanding how participation can affect policy implementation is the Advocacy Coalition Framework (ACF).

The ACF approach to policymaking was an attempt by Paul Sabatier to develop a theoretical model of policymaking that was more reflective of the complexity and reality

of the policymaking process than the stages' heuristic. While the stages' heuristic is very informative as a step-by-step description of the policy process, the authors of the advocacy coalition approach felt that the stages' heuristic failed to capture the complexity of the process.⁷ The advocacy coalition approach sees policymaking as a complex process whereby groups of likeminded individuals known as advocacy coalitions join together in an attempt to alter policy decisions to better reflect the preferences of the group. Within a given policy subsystem there is almost always more than one advocacy coalition representing the affected interests, and these coalitions are bound together by a set of beliefs. During the policymaking process, the advocacy coalitions and their corresponding belief systems are subjected to a series of external elements which shape the nature of the policymaking process. These external elements act for a period of time to shape the policy outcomes of the policy subsystem, and may in certain cases alter the beliefs of those within the advocacy coalition itself.

As a theoretical approach, the ACF succeeds in capturing the complexities, “dynamics, and structure of the policy process, but presents an image of the policy process that is arguably as abstract and unrealistic as any other model—if not more so” (Theodoulou and Kofinis 2004: 88). So as a theoretical approach, what leverage does the ACF give us in understanding how competition amongst the affected interests influences implementation of the SMCRA? In short, it gives us a framework with which to examine the complex relationship between competing advocacy coalitions, and how changes in the political and socioeconomic environment surrounding the policy

⁷ In fairness to the stages' heuristic of policymaking, its parsimony is certainly part of its charm. And while the complexities of the policy process may not be explicitly stated, there is also no implication that the process is a simple one.

subsystem can affect policy outcomes. In terms of implementation of the SMCRA, environmental factors concerning the competing groups have changed so much in the time since the act was adopted that many of the underlying assumptions concerning implementation of the act have also changed. It is this change that is the primary concern of this dissertation.

Organization of This Dissertation

The basic hypothesis of this proposal can be stated as follows; the politico-economic environment (combination of state political and economic factors, state political system structure, and interest group strength) within the regulatory policy arena concerning the coal industry in the United States has changed so dramatically that even though the industry is weak, it is no longer politically feasible to protect it in most areas.

The purpose of this dissertation will be to review some of the related scholarly work in the field of regulatory policy generally—and on the topic of coal industry regulation more specifically (Chapter II)—and then to formulate some hypotheses (Chapter III) to be tested in this project. This dissertation will conclude with a detailed plan to test, both qualitatively (Chapter IV) and quantitatively (Chapter V), the effect of the perceived major variables on state implementation of the *Surface Mining Control and Reclamation Act*. The dissertation will conclude (Chapter VI) with a discussion of the results from the qualitative and quantitative tests, as well as brief discussion of how these findings contribute to our knowledge in terms of state-level implementation of a federal regulatory program.

The contribution of this work to the existing literature on regulatory policy is twofold. First, this research applies rigorous statistical analysis to the study of surface mine regulation. The existing literature on the subject is lacking in that it focuses either on a small cross-section of states at some distinct time period, or it focuses simply on one state over a small section of time.⁸ In contrast, this paper will analyze all coal-producing states (twenty-four) over the first twenty years of the SMCRA. Second, this study examines how changes in the power equilibrium of the affected interests can alter the effect of political and economic factors in terms of state-level implementation of federal programs.

The concepts discussed to this point are essential components of this dissertation, but before an in depth examination of these topics begins, one should first provide a base of reference from which to draw in further discussions. Working toward that end, I will devote the next chapter to reviewing some of the existing literature in order to provide some background information on some subjects that will become more relevant at later stages of this paper; notably the concepts of regulatory policy—and the effects of federalism, state-level political and economic conditions, and competition within the policy arena on this type of policy.

⁸ One notable exception to this claim is Neal D. Wood's dissertation project *Rethinking Regulation: Institutions and Interests in State Regulatory Enforcement*. A thorough discussion of Dr. Wood's project and how it fits into the existing literature in the field is presented in Chapters II and III of this dissertation.

CHAPTER II

OUR FIVE QUESTIONS ADDRESSED IN THE EXISTING LITERATURE

Any study that proposes to examine how federal regulatory policy is implemented must first begin with a review of the existing literature to determine which factors we might expect to be relevant in the policy implementation. The existing literature that is of particular relevance to this study can be divided into two groups depending on their focus. The first group that is worthy of note is the literature concerning implementation of protective regulatory policy in general. Since the implementation of the SMCRA is a subset of this larger policy type, factors relevant in this type of implementation are also relevant here. The second group includes those studies which look at implementation of the SMCRA in particular. It is important to study this literature to determine what has been done in the field, and assess whether or not a theoretical contribution can still be made. The remainder of Chapter II will address each of these issues, and provide a base of expectations concerning the implementation of federal regulatory policy in general, and the SMCRA in particular.

The existing literature can then be further divided into groups depending on how they address the five questions that are the concern of this dissertation. From this examination of the existing literature, I will develop a series of expectations concerning state-level implementation of federal regulatory programs. From this series of expectations, I will develop a couple of hypotheses concerning how competition amongst the affected interests within the policy arena surrounding coal production influence state-level implementation of the Surface Mining Control and Reclamation Act of 1977.

Is There Discretion Present in the Implementation of Federal Regulatory Programs?

The purpose of this dissertation—as stated before—is to outline a course of action which is to advance, and develop a method for testing a couple of hypotheses concerning the extent to which competition amongst the competing interests surrounding the production of coal in the United States produces variations in the level of “enforcement vigor” (Thompson and Scicchitano, 1986) exhibited by the states in the implementation of the Surface Mining Control and Reclamation Act of 1977. The main concern with determining what is responsible for this perceived variation is to examine whether or not outside factors can affect implementation of the SMCRA, and if so, how much bureaucratic discretion is present within the state-level agencies that implement the SMCRA. In order for outside political and economic influences to affect the implementation of the SMCRA, there must be some discretion built into the system at some level. Since the SMCRA is a federal regulatory program, one might logically assume that the political pressure asserted on the system would come from the federal government. However, since the SMCRA is implemented by state agencies under the watch of the federal government, then the discretion may exist at the state level. If the system seems to be completely insulated from influence of any kind, then one must assume that either the structure of the implementing agency is so tight that it is impermeable by outside influence, or those who have discretion in action have no sufficient reason to exert that discretion.

Hunter and Waterman (1996) hypothesize that individual agencies can have a great deal of discretion in their implementation of federal regulatory policy. Their analysis was centered on a study of the implementation of the Clean Water Acts by not only the Environmental protection agency (EPA), but by the National Pollutant Discharge Elimination System (NPDES) as well. Their reason for doing this is to outline the possibility of influence at multiple levels of the regulatory agency. In this case the NPDES works under the supervision of the EPA. Hunter and Waterman predict that the bureaucratic style of implementation used by the EPA, and the NPDES in particular, is open to influence from the regulatory environment. This type of bureaucratic style is called “pragmatic enforcement.” Pragmatic enforcement assumes that the agents who are responsible for implementing policy have at their disposal, some manner of discretion in action, which allows them to adjust implementation to better fit the regulatory environment. This assumption seems to be in line with the notion of state primacy of policy implementation discussed earlier in this paper. Hunter and Waterman predict that this type of discretion is likely to exist not only within the EPA and NPDES—which is the focus of their study—but in other types of federal regulatory agencies as well. In order to test this prediction, this dissertation will examine closely the agencies responsible for the implementation of the SMCRA, to determine whether or not evidence exists that might lead one to think that there is some high level of bureaucratic discretion in place which allows individual agents at the state level to influence implementation.

If one believes that some agencies are open to bureaucratic discretion in terms of severity of penalties in terms of policy implementation, then there must be some set of determinants which should be present. The notion of bureaucratic discretion, as described by Hunter and Waterman leave only three possibilities in terms of agency discretion. First, there is a situation where bureaucratic discretion does exist within a particular agency, and there is sufficient evidence of variation in implementation present to support such a claim. The second possible situation is one in which the agency does possess some manner of bureaucratic discretion, but for one reason or another does not seem to utilize this discretion in terms of implementation. The third possible situation is one in which the agency does not exhibit any evidence of bureaucratic discretion, because the agency does not have any discretion in implementation.

So what is the answer to the question of whether or not states actually have discretion in action in implementing the SMCRA? Much of the literature in the field seems to point to the answer that yes—at least anecdotally or during certain time frames or in certain areas—variation does exist at the state level. Desai (1989b: 67) describes what he calls “significant variations in the impacts of the SMCRA in six major surface coal mining states.” In his study Desai (1989b: 100) examines levels of enforcement activity in six of the largest coal producing states (Kentucky, Pennsylvania, West Virginia, Illinois, Wyoming, and Montana). Desai examined inspection and enforcement activity by “reviewing: (1) frequency and completeness of inspection; (2) percentage of violations actually cited by state inspectors; (3) timeliness and appropriateness of enforcement actions; and (4) adequacy of assessment and collection

penalties.” The author states that the intended purpose of his research was to “assess the impacts of the SMCRA, not to provide explanations for the differences among states” (1989b: 106), and for my part I will take him at face value and not speculate. Even though, as Desai (1989b: 98) points out, these states “contain over 80% of all surface mines, and they produced about 70% of all surfaced mined coal in the United States”, this examination is hardly exhaustive. Though, for our purposes, it does provide evidence of variation in enforcement activity. That means that the overlying federal regulation does not preclude state-level influences from affecting enforcement of the SMCRA.

Two other prominent studies—one by Davis, Davis, & Peacock and one by Scicchitano, Hedge, and Metz—also found significant variation in implementation of the SMCRA. Davis et al (1989: 113) noted that “considerable between-state variation is found not only in the number of inspections carried out for each unit, but also in the willingness to pursue more serious forms of enforcement action such as issuing NOV’s and COs.” The data analyzed in the Davis et al piece included enforcement activities for a single year⁹ in 10 coal producing states: Illinois, Indiana, Kentucky, Montana, Ohio, Pennsylvania, Texas, Virginia, West Virginia, and Wyoming. Similarly, Scicchitano et al (1989: 127) describe what they call “substantial variation in enforcement scores. Even for complete inspections, the basic, mandated enforcement action, there is variation.”¹⁰ If we have established that variation exists to some degree, what might be

⁹ In most states the data describe 1987 mining operations, but for Virginia, West Virginia, and Wyoming the reports describe 1986 data.

¹⁰ Scicchitano et al employ enforcement activity data for 22 coal producing states for the years 1983-1984.

causing this variation? The answer to that question will be addressed in the coming sections.

How Does Federalism Affect the Amount of Discretion Used in Implementation of the SMCRA?

One of the key aspects of the SMCRA is the amount of authority granted to the states in implementation of the act. While this is certainly not unique for a piece of environmental legislation passed at that time, it does provide at least the expectation of an increase in the amount of discretion which is going to be available to state agencies in implementation. The SMCRA presents an implementation design that has been variously described as “cooperative federalism,” “partial preemption,” and “state primacy” (Desai, 1989a: 67).

With the passage of the SMCRA, the federal government not only instituted a comprehensive program to regulate the surface mining of coal throughout the country, it also established a federal regulatory agency to implement and administer the law, the Office of Surface Mining within the Department of the Interior. This strong initial step was deemed as being necessary due to the perceived lack of effective implementation by the states when they were in control of surface mine regulation.

But while the SMCRA established a set of national guidelines in terms of surface mining and reclamation along with a set of permitting procedures that the coal industry had to follow, it also allowed “state primacy” (Harris, 1989: 69). At the time, the selection of a state primacy model for implementation was both an easy and logical

choice. The model had already been used in several other environmental statutes. The notion of state primacy is based upon a model of “cooperative federalism” between the state and federal governments. This model is normally chosen because each entity possesses something of value to the other. In the case of the SMCRA, the states “did not have the economic, technical, or political resources” to effectively regulate; therefore, the federal government developed a comprehensive regulatory program, and established a set of standards to be used by the states in establishing their own programs (Harris 1989: 69).

The early literature on regulatory policy contained relatively little information on the role of the states in implementing, and thereby shaping, federal regulatory policy (Wilson, 1980). There are two potential reasons for this apparent gap in the early literature: (1) Prior to 1960, federal regulatory policies rarely assigned significant implementation roles to the states, (2) A propensity, within the discipline of political science to pay more attention the formulation and enactment of protective regulatory policies, than to their implementation (Thompson and Scicchitano, 1985).

While the exact reason for the gap in the literature involving the role of the state in implementing federal protective regulatory policy is not clear, what the literature actually does have to offer on the subject is clear. The main focus of the early literature concerning state implementation of federal programs was on a few qualitative analyses of specific programs (Aron, 1979; Menzel, 1981) and of legal analyses of the concept of “regulatory federalism” presented in Kanouse (1980) and Stensvaag (1982). There was also some early literature which focused on quantitative analysis. The problem with this

early quantitative literature is that it focused on expenditure data (Game, 1979), which is problematic in that it measures inputs, and not outcomes. Another focus of the early quantitative literature in the area is on policy mandates as a measure of state enforcement of regulatory policies (Lester et al., 1983), which ignores completely street-level enforcement of protective regulatory policy.

One early attempt in the literature to focus on the street-level enforcement of policy was Marvel's (1982) work on performance of the states in enforcement of the Occupation Safety and Health Act (Thompson and Scicchitano, 1985). Marvel's study was limited in scope, and suffered from a number of flaws that inhibit the formulation of general theory regarding state-level implementation of protective federal regulations. The first limitation of Marvel's work was her focus on only one dependent variable, inspections of work places. Other variables, such as the number of penalties and citations levied, or the number of workplace incidents reported, would also be a measurable effect of policy implementation. Marvel's study is also limited in that it focuses only partially on measuring differences in state performance, and her results are only moderately successful in explaining the variation in existing state programs. The final limitation of Marvel's work—as well as the early work on implementation of the SMCRA—is that it focuses on the time period immediately following passage of the statute, when many state programs have not had sufficient time to work out the bugs in their implementation systems.

Thompson and Scicchitano's work (1985) addresses many of the problems involved in early work on state level implementation of federal programs, but its focus is

on state implementation of OSHA policy. The major difference between implementation of OSHA policy and SMCRA policy is the level and strength of incentives present which influence states to choose to implement their own policy. Another difference which should be noted is the assumptions which are made regarding the influence of strong unions on the implementation process.

The work by McElfish and Beier (1990) is a comprehensive qualitative work which looks at virtually every aspect of the SMCRA. This work is absolutely exhaustive of the type of questions which are typically asked about a policy. It begins with an introduction to the legislative action which led to the passage of the SMCRA. This is followed by an introductory chapter into the methods of surface mining, and their corresponding effect on the environment. Chapter III of this work describes the “Core Issue” of the implementation of SMCRA as being the Federal-State relations, and the corresponding effect of federalism on the implementation process. The remainder of the book deals with the methods which states have at their disposal to enforce the SMCRA, such as selective permitting, reclamation bonds, mine inspections, citations and penalties, as well as the negative effects of regulatory non-compliance on the environment. The major problem with this work, is that it is too qualitatively centered on one program to provide any generalizable theory which might add to the broader knowledge of state implementation of federal programs, and what effects the process; however, in light of the highly descriptive intent of this case study, it was hardly their intent to do so.

There are two significant journal articles which address the affects of federalism on the Implementation of the SMCRA in particular. The first article is by Richard Harris (1989) and examines the question of how appropriate the strategy of “cooperative federalism” is for implementing environmental policy. Harris claims that his examination of the implementation of the SMCRA provides us with two lessons concerning the viability of “cooperative federalism” as an implementation strategy. The first suggestion provided by Harris is that both the state and federal regulators must agree as to both the ends and the means of a regulatory program. Harris claims that from an ends standpoint, this is very difficult. Harris notes that this is easy for the federal government because they always seem to focus on one or two main objectives. Harris finds that this becomes more problematic when dealing with the states. The state implementing agencies are often subjected to many opposing forces—local coal industry, environmentalists, federal agencies to name a few. Furthermore, the size, composition, and measures of influence of each of these groups are highly variable from state to state. Harris (1989: 76) notes that “unless there is general agreement, different states will pursue different visions of the law.” His remedy? A stronger role for the federal government in implementation of the SMCRA. Harris states that “a strong federal program anchors state programs concretely with clear enforcement responses established for particular offenses, improved information systems, and highly specific regulations. Even with a clear set of parameters established in Washington, federal leadership in cooperative federalism is a must if states are to withstand the economic pressure to regulate at the lowest common denominator” (1989: 76).

With this suggestion from Harris noted, is a more dominant role in implementation of the SMCRA likely? Not according to Richard Miller. In his article “Implementing a Program of Cooperative Federalism” (1989), Miller notes that “state preeminence in surface mining regulation is likely to be a permanent feature.” The author says that the reasons for this go beyond the general slant toward state regulation inherent in the statute, and the general notion of states rights. He states that if we are, in fact, in a “contractive phase of American federalism, then fiscal conditions are likely to constrain the vigor of the federal government in many ways. A federal takeover of a state regulatory program is an expensive proposition. Informal estimates for the federal government to assume primary jurisdiction in a major coal state such as Kentucky have been in excess of 40 million dollars” (Miller 1989: 86). And remember, this was written 16 years ago.

If state preeminence is inevitable in implementation of the SMCRA, then what are some of the competing interests which Harris states “push and pull” at state implementing agencies? Some are clearly political in nature, and they constitute our next matter of concern.

How Do Political Factors at Both the State and National Level Affect Implementation of the SMCRA?

The next question which is of concern in this dissertation deals with the political factors which can influence implementation of the SMCRA. The basic assumption behind the theory of political control of bureaucratic action is quite simple. Most

democratic theorist state that federal elected officials should, and actually do affect the behavior of bureaucratic agencies charged with implementation. The should part of the argument is tied to the notion of overhead democracy, and its usefulness in terms of making the bureaucracy accountable to the public by making it responsive to the elected political powers that be. Overhead democracy is basically a two step process. In the first step, the President and Congress are held accountable to the voting public through the ballot box. The second step, makes the unelected, and seemingly unaccountable bureaucracy responsive to the elected members of the federal government through a series of control mechanisms.

Early literature seemed to focus on a model of agency action that was focused on the idea of bureaucratic dominance. The major contention of the bureaucratic dominance literature was that agency employees possessed considerable discretion and autonomy for a number of reasons. The most important of these reasons were that the bureaucracy possessed an information asymmetry in dealing with the political powers because of their field specific knowledge, that the constitution weakened federal governmental institutional power through fragmentation, and that Congress was slow to control bureaucratic action due to apathy (Ogul 1976; Dahl and Lindblom 1953; Dodd and Schott 1979).

More recent literature suggested that this was not an accurate depiction of reality, and that in fact that the president and congress can exert significant control over bureaucratic action. The question in terms of political control that remained was what are the best mechanisms available for controlling the bureaucracy? The existing

literature makes cases for the use of the formal and informal control mechanisms of appointment power, budgets, oversight activities, agency structure, and signaling (Woods 2003; Carpenter 1996; McCubbins, Noll, and Weingast 1987; Moe 1985; 1982; McCubbins and Schwartz 1987; Weingast and Moran 1983). The contributions of the early pieces of this literature opened the floodgates, so to speak, in terms of the study of political influence as a control on bureaucratic activity. Empirical studies based on the notion of political control have found evidence of congressional and presidential influence in the National Labor Relations Board, the Environmental Protection Agency, the Federal Trade Commission, and a host of other federal regulatory agencies including the Office of Surface Mining (Wood and Waterman 1994; Wood 1990; 1988; Moe 1985). While the contribution of this literature is an important one, much of the debate centered on which federal institution was best suited to exercise control over the bureaucracy, and which of the control mechanisms available was most effective. As this dissertation is concerned with political influence at the local or state level, examination of another portion of the political control literature is warranted.

Scholz et al (1991) suggest that the dispersed nature of many federal regulatory programs, where much of the “production work” of the implementation process is accomplished in field offices, provides discretion to bureaucrats within the regional field offices and allows local political officials an opportunity to influence implementation. The authors argue that this “local democratic control can occur for three reasons: (1) the “home-style” leadership of members of congress, which helps to align agency behavior with local political preferences; (2) the general political culture within an area, which

determines who gets elected and who occupies positions in the bureaucracy; and (3) local coalitions or officials who may exercise informal control because they possess resources necessary for the accomplishment of agency goals and objectives. Evidence of these expectations is provided in an analysis of county level Occupational Health and Safety Administration enforcement activity. A series of other studies have confirmed the influence of state and local level political preferences on federal regulatory policies including the SMCRA (Headrick 1990; Hedge, Menzel, and Williams 1988; Scholz and Wei 1986).

While the literature examining political influence on policy implementation is vast, what of the literature examining the effect of political influence on the SMCRA in particular? The best example of this type of research is the dissertation of Neal D. Woods (2003) entitled, “Rethinking Regulation: Institutions and Interests in State Regulatory Enforcement.” Woods dissertation examines the implementation of federal regulatory programs using the method of partial preemption. The author contends that the use of partial preemption as an enforcement strategy is, according to “many observers...precisely the wrong way to implement these policies, because it allows states to respond to politically important private interests by reducing the stringency of state enforcement effort” (Woods 2003, abstract).

In his research Woods argues that much of the existing research which examines the link between economic power of the affected industry and the “stringency of state regulatory enforcement” is lacking due to the glaring omission of the potential influence of state political institutions. In his conclusions, Woods finds that in fact, state political

institutions can have a mitigating effect on the relationship between state regulatory enforcement activity and the economic power of the industry being regulated. This is an important work, which reaches an interesting conclusion about variation in implementation of the SMCRA, but differs from the research presented in this dissertation in one key aspect.

The difference between Woods research and mine is reflective of our respective backgrounds and training. Woods approaches the study of public administration and public policy from an American politics perspective, which reflects his educational background and training, and as such concentrates his study on the potential influence of state-level political influences. My approach to the question of variation in implementation differs from Woods', and reflects some of my own biases. I approach the question of variation from the standpoint of competition between the affected interests within the policy arena. A more complete discussion of my approach is, of course, forthcoming.

Another example of a study which examines the effect of political influences on implementation of the SMCRA is the book by Ripley and Franklin (1986), *Policy Implementation and Bureaucracy*. In chapter six of their book, Ripley and Franklin look at the implementation of protective regulatory policy, and provide four examples, one of which is on the implementation of the SMCRA. While this work only provides a rather short, qualitative study of the implementation of the SMCRA, the "value added" in reading this work is a short section on the contextual settings in which the Office of

Surface Mining was forced to pursue effective implementation. Ripley and Franklin offer six contextual factors which, they feel affected the implementation of the Act:

1. First, there was a large amount of hostility which was created during the drafting of the enabling legislation which, consequently, carried over into the implementation process. Although the final legislation was a “watered down” version of the original proposition, the vested interests were still largely at odds over the final outcome of the Act.
2. Second, there was a changing perception in the country concerning the need for strict environmental legislation due to the economic recession that the United States was experiencing during the late 1970’s. As has been noted in previous literature in the field of environmental policy, a clean environment is often considered to be a luxury, which people are worried about when everything else is running smoothly.
3. Third, the Reagan administration was staunchly anti-large government. They stressed a state control in regulation, a diminished federal role, deregulation, and an “unshackling” of the private sector. This philosophy was strong throughout the administration, but no more so that in the Department of the Interior under Secretary James Watt. This was a major change from the Carter administration which had adopted, and begun to implement the SMCRA.
4. Fourth, the Department of the Interior began to adopt the viewpoints of Secretary Watt across the board, which included the concept of federal stewardship in regulation. This left most of the protective regulatory

responsibilities to the states, while the Department of the Interior shifted from its traditional pro-conservation stance to one of acceptance of development and resource extraction.

5. Fifth, all new agencies experience some level of “growing pains”, where they seek to establish organizational norms and effective strategies for implementation. The Office of Surface Mining not only found itself struggling with the normal adjustment period which agencies must go through, but also found itself embroiled in controversy from the very beginning.

6. Finally, implementation of the Act required the services of a wide array of actors across many various levels and institutions of government. The actors which were involved at the federal level were bureaucrats and political appointees within the Department of the Interior, federal court judges, attorneys within the department of justice, and various members of congressional committees and sub-committees which were involved in oversight. At the state and local level, you had state bureaucrats and governor’s staffs, coal companies, utilities dependent on coal, and a wide assortment of environmental and citizen groups.

While all of these factors are important in understanding the difficulties with which the act was initially implemented, the most important contribution that this study makes to the current understanding of policy implementation lies in the notions presented in factors three through six—which expound upon the notion of outside influence in regulatory policy. The view of the regulatory agency presented in this book is much

different than the traditional agency capture view which is prominent in the early literature (Lowi 1969; Kolko 1963; Bernstein 1955; Huntington 1952). While the second factor presented in this work clearly addresses economic factors which might affect implementation, it does so by discussing how economic factors might influence political actors to become involved in the process.

Another piece which deals directly with the implementation of the SMCRA is the Wood and Waterman (1994) book, *Bureaucratic Dynamics*. The main focus of this work is the role of the bureaucracy in the policy process. While this work does not deal explicitly with the implementation of the SMCRA by the Office of Surface Mining, a study of the history of the policy implementation process under SMCRA is included. Wood and Waterman's book is a comprehensive quantitative analysis of the policy implementation process which looks at several governmental agencies. The focus of the book deals more with the institutional factors which can affect policy implementation, than it does on the policy environmental factors which affect implementation. Wood and Waterman find that the president can have a significant impact on policy implementation through either the appointment process, or through signals sent to the agency concerning policy preferences. While this is a very important work in studying the way in which the bureaucracy can be affected in the implementation of public policy, it does not answer the questions directly as to what effect the federalist implementation strategy of the SMCRA has on the desired outcomes of the policy. In order to do this, one would have to look at the state-level, or perhaps even street-level, factors which affect policy implementation, not the simply the national institutional factors.

In their article “Regulating in Space and Time: The Case of Regulatory Federalism”, Hedge and Scicchitano (1994:134) state that their analysis indicates that “the regulatory decisions of federal authorities at OSM reflect shifts in the nation’s political climate, the freelancing efforts of individual members of Congress, and the states’ political climates.” However, the Hedge and Scicchitano piece examines enforcement activities of the federal regulatory agency, not the state agencies. Since primacy has been achieved in all states implementing the SMCRA, I think that state-level variation is a better measure. Davis et al (1989: 114) attempt to solve this problem by examining the effect of state-level political forces on implementation of the SMCRA using a partisanship hypothesis. The study finds what the authors characterize as a “more pronounced” link between political variables and measures of regulatory enforcement. They find that Democratic states are more likely to issue NOV’s than are Republican states. Seemingly contrary to this opinion is the fact that they also find evidence which suggests that those states with a higher percentage of conservative voters issue more NOV’s than states with a higher percentage of liberal voters. They attribute this contradiction to regional variation, citing bias based upon southern Democrats. I do not lend as much credibility to this explanation, since the time period of the study is 1987. It seems to me that the heyday of the conservative southern Democrat was certainly waning by this time. They also claim in their study that “states with a history of concern for environmental quality are more likely to utilize COS as an enforcement tool” (Davis et al 1989: 114). As stated previously though, their study examines only one year of enforcement activity for 10 coal producing states. I think that for any type of

real generalizations to be made, a more rigorous examination is in order. So the question remains, do political factors make a difference in state-level implementation of the SMCRA? I think that question remains unanswered. Perhaps the research in this dissertation will shed more light on that subject.

How Do Economic and Market Forces Affect Implementation of the SMCRA?

The theoretical evidence to support the notion of economic forces affecting the implementation of federal regulatory programs seems, at face value to be quite compelling. In terms of this dissertation, the theoretical assumptions made concerning the impact of economic forces are derived from Meier's (1985) book *Regulation: Politics, Bureaucracy, and Economics*. Meier notes that "economics has played a continuous role in the literature on regulation. The classical justifications for regulation, for example, are economic; regulation is justified when a market system fails" (1985: 30). Meier continues to conclude that while market failures can be used to justify regulation, that other factors can be more important in determining the "direction of public policy." Meier lists several market factors which can affect implementation and groups them according to what he calls economic factors and technology factors. For the research which comprises this dissertation, I will focus on one factor from each group, profitability and substitutability.

In terms of profitability, Meier notes that "industries vary a great deal in their profitability" and that while "industries with low profits may create demands for regulation, a low profit structure limits the type of regulation that a regulator can

undertake” (1985: 32). The general underlying assumption being that in industries with a high profitability, regulators can impose more stringent regulation without worrying about imposing too high of costs on the industry being regulated. While Meier’s examples in the book examine variability in profits from industry to industry, the same logic can be extended to variability over time within a single industry. It is this type of variation in profitability that I am concerned with. At the time of the adoption of the SMCRA, the coal industry was experiencing near record profitability based upon the fact that the United States was emerging from the energy crisis of the early 1970s when oil shortages made us focus on other sources of energy. With the abundance of coal reserves here in the United States, it was a natural choice to fill in during the shortage. In the time since the adoption of the SMCRA, the price of coal, and the relative profitability of the industry has steadily declined. If regulation of the industry follows the model set by the preceding assumption, then we should see a gradual easing of regulatory vigor over time in regulation of the SMCRA, due to this decrease in profitability.

The other factor presented by Meier affecting regulation is substitutability. Meier defines substitutability as “the extent that substitutes are available for the industry’s products or services.” He then asks the rhetorical question, “are there alternative technologies available in the industry or in other industries that would permit someone to offer a comparable good or service?” (1985: 33). In terms of the coal industry in the United States generally, the answer must be yes. This is based upon the previous notion that the price of coal has dropped steadily since the late 1970s. However, I feel that this

is not the only question concerning substitutability that should be of concern in this dissertation. Certainly, at a national level we have found substitutes for coal industry resources, however this notion may not translate to individual states. There are some states which are more dependent on coal than others, and for these states the good or service that is being provided by the coal industry is jobs and general revenue. In these states there may be no substitute available for the coal industry. So what does the notion of substitutability tell us about the regulation of the coal industry in terms of the SMCRA? At the national level, and within states that do not rely heavily on coal dollars as a resource, the ready availability of substitutes for the goods and services provided by the coal industry signals a lack of dependence on the coal industry, and as such we might expect regulatory enforcement vigor to increase. However, in those states where there is no ready substitute for the jobs created by, and the revenue generated by the coal industry, we should expect regulatory enforcement vigor to decrease. While these factors will be the cornerstone for the hypotheses developed and tested in this dissertation, they are not the only relevant economic factors.

Another important work in the field of protective federal regulatory policy implementation, and certainly the most comprehensive in terms of dealing directly with the implementation of the SMCRA through the Office of Surface Mining, is the book by Shover, Clelland, and Lynxwiler (1986), *Enforcement of Negotiation: Constructing a Regulatory Bureaucracy*. This book traces every step of the implementation process through the passage of the enabling legislation, to the creation of the regulatory agency, through the decision to use enforced or negotiated compliance, to the effectiveness of

implementation exhibited in the early stages of the implementation process. The book provides a useful description of the difference between enforced compliance, usually associated with strong, federal government agency enforcement of a protective regulatory policy, and negotiated compliance, usually an informal relation between federal and state government agencies, and the regulated interests. Obviously, negotiated compliance is generally considered to be less rigorous in nature than enforced compliance, and is also generally the implementation style of preference for the regulated interests.

In addition to providing the perspective on types of compliance, the book also lays out nicely a set of findings which can be used to generate theory regarding the state implementation of protective federal regulatory policies. The conclusion of the book attributes the decisions which were made in the implementation of the SMCRA to neo-Marxist state theory. The research on the subject in the field of SMCRA implementation seems to provide little support for this notion.

In terms of the impact of economic factors on state-level implementation of the SMCRA, Davis et al (1989) and Hedge and Scicchitano (1994) find little evidence to support the notion of economic dependence constraining regulation. Davis et al find that states with a higher per capita income have a greater incidence of inspections, but these states are less likely to depend on the coal industry as a major employer. Despite this finding, the authors note that “state economic indicators are unrelated or weakly related to the use of stronger enforcement measures. Hedge and Scicchitano (1994: 148), in spite of their claims that state-level political and economic factors “moved agency

officials toward a flexible style of enforcement that allowed for substantial interstate variation in the rate of oversight”, seem to provide little empirical evidence that economic factors influence regulation. So, despite good theoretical rationale for suspecting that economic factors might influence state-level implementation of the SMCRA, there is little empirical evidence to support this notion in the literature.

How Does Competition Among the Affected Interests within the Policy Arena Affect Implementation of the SMCRA?

The key to understanding policymaking in the United States is to understand the concept of political subsystems, and what causes people affected by policy to participate in these subsystems. Some of the most important work in this area was done by Paul Sabatier and Hank Jenkins-Smith in their Advocacy Coalition Framework. As such, the ACF will provide the basic framework with which I will examine the questions of concern in this dissertation.

The Advocacy Coalition approach to policymaking was an attempt by Paul Sabatier to develop a comprehensive theory of the entire policy process. Sabatier felt that the model of policymaking exhibited by the stages heuristic (Anderson 1997; Jones 1984) was too simplistic and sought to develop an approach that would capture more of the detail and complexity of the policymaking process. In their book *The Art of the Game: Understanding American Policymaking*, Theodoulou and Kofinis (2004: 87) attempt to summarize the ACF by stating that its initial premises emphasized the following factors:

- The role of technical information on the understanding of the problem
- A time frame in which policy change occurred over a decade
- A focus on the policy subsystem as the analytical center for the policy process
- An expansion of the traditional notion of the iron triangle to include all levels of governmental actors and noninstitutional actors
- The understanding that the programs reflect an implicit belief system

Policymaking, according to the ACF consists of a complex system in which individual policy subsystems are influenced by two groups of elements external to the system. Sabatier identifies the two groups of external elements as being stable elements and dynamic elements. The stable elements are those which are determined to be difficult to change over time. These elements include the formal structure of the political system, the political culture and socio-cultural values within the subsystem, and the resources that are available to the state (Sabatier and Jenkins-Smith 1999: 120).¹¹ Woods' (2003) dissertation, which was discussed earlier in this chapter is a good example of a contemporary studies which examines some of the influence of the more stable elements of the policy subsystem.

The second group, the dynamic elements represent those elements that do change over time. The dynamic factors include political factors, such as the election of a new presidential administration, or a change in the majority party in Congress. Also included in the group of dynamic factors are socio-economic conditions. Theodoulou and Kofinis

¹¹ For more detail, see Paul A. Sabatier and Hank C. Jenkins-Smith, *Policy Change and Learning: An Advocacy Coalition Framework* (Boulder: Westview Press, 1993).

(2004: 87) note that “socio-economic changes, brought on by economic downturns or social cleavages, also redefine the greater context in which policy develops.” The last of the dynamic factors are policy decisions made within the subsystem. These discreet decisions, once adopted and implemented can “alter the context by redefining both the problem and policies that are explored within a given policy subsystem” (Theodoulou and Kofinis 2004: 87).

Understanding the composition of these subsystems and how they work is the key to understanding the policymaking process according to the ACF. The authors note that these subsystems develop around individual policy groups, and the affected interests each bond and form set groups known as advocacy coalitions. The composition of these advocacy coalitions includes both traditional and nontraditional actors who are bonded by their shared set of beliefs and “engage in a nontrivial degree of coordinated activity over time” (Sabatier and Jenkins-Smith 1999: 121). Each of the advocacy coalitions within the arena is fused by a common set of beliefs which the authors use to explain not only the cohesiveness of the group, but the actions of the group within the policy arena as well.

These beliefs, which dominate the composition and the actions of the advocacy coalition can be divided into three levels—deep core beliefs, policy core beliefs, and secondary beliefs. Theodoulou and Kofinis (2004: 87) note that “deep core beliefs represent the critical normative beliefs of the members.” Deep core beliefs are those which represent the group’s values and priorities concerning politics and perhaps life in general. Examples of concepts which represent deep core beliefs are things such as

equality, freedom, right to life, right to privacy, etc. Deep core beliefs are the general set of values which guides a group's stance on policy areas. For example, if your deep core belief is that it is fundamentally wrong for a government to sanction the taking of a life, then you are likely to be against the death penalty, as well as abortion. In this case, your underlying belief in the right to life would direct your policy beliefs.

Policy core beliefs are different in that they represent “a coalition's basic normative commitments and causal perceptions across an entire policy domain or subsystem” (Sabatier and Jenkins-Smith 1999: 121). These policy core beliefs are described by the authors as the “fundamental glue of coalitions” (1999: 122). In the case of our previous example, we might have an advocacy coalition that is absolutely committed to the right of a woman to choose whether or not to have an abortion; however, their deep core beliefs could be quite different. One member of the group may hold this belief because they believe in the right to life, while others may believe in a right to privacy, and a third group may simply believe in women's rights. While none share the same deep core beliefs, all share the same policy beliefs.

The third group of beliefs discussed in the ACF is that of secondary beliefs. Secondary beliefs are generally much narrower in nature and may not even be consistent within the policy community. Examples of this may be a group of people who all believe in a woman's right to choose whether or not to have an abortion. In this group there may be those who feel that this right should be unlimited. Others may feel that this right should exclude abortions performed in the third trimester. Still others may feel that this right should only be extended in the case of rape, incest, or inherent danger to the

life of the mother. Generally speaking, the ability to change these beliefs increases from deep core, to policy core, to secondary beliefs.

Fundamentally, the goal of each advocacy coalition is to alter policies so that they conform to the preferences and beliefs of their members. As the policy is implemented and new information becomes available, coalitions may rethink their strategies and preferences concerning certain policy goals. This being noted, members of advocacy coalitions are very unlikely to change their deep core beliefs, and almost as unlikely to change their policy core beliefs. As Theodoulou and Kofinis (2004:88) note, “whereas secondary beliefs can be changed, revision of deep core and policy core beliefs may require extreme measures to shift the members’ belief system.

How does this notion of competition affect implementation of the SMCRA? I have made the claim that the power equilibrium between the “affected interests” or “advocacy coalitions” within the surface mine policy arena has fundamentally changed since the adoption of the Act. This change in the power equilibrium is directly addressed by the ACF. The ACF claims that external elements and new information affect the relationship between the advocacy coalitions and also alter their policy goals and desires. But despite my claim, has the power positions of the affected interests actually changed? A partial answer to that question is provided by Bosso and Guber (2003: 91) in their article “The Boundaries and Contours of American Environmental Activism.”¹² Within the article, the authors review an April 2001 investigative series by Sacramento Bee reporter Tom Knudson called “Environment, Inc.” in which Knudson

¹² As seen in Norman J. Vig and Michael E. Kraft eds. 2003. *Environmental Policy: New Directions for the 21st Century*. Washington, D.C.: CQ Press.

describes “some of the less pleasant aspects of public interest advocacy, among them the constant fundraising, the bureaucratic tendencies of large organizations with professional staff and well-paid executives, and conflicts between national environmental groups and local activists.” The authors go on to describe Knudson’s summation of the modern state of environmental activism as “damning”:

Put the pieces together and you find a movement estranged from its past, one that has come to resemble the corporate world it often seeks to reform... “National environmental organizations, I fear, have grown away from the grass roots to mirror the foxes they had been chasing...they seem to me to have turned tame corporate and compromising.”

While this type of criticism may seem “damning” to a group of environmental activists, it is hardly criticism at all to a public policy scholar. In fact, this type of information provides evidence to the policy scholar that the environmental lobby is trying to affect policy by actually sticking to principles that we believe work within the policy subsystem. Policy scholars have long noted in their criticism of the notion of pluralism, that those groups who are well educated, well funded, and well organized, with a large, politically active membership have a great advantage in the policy arena. If that is the case, then the only effective way for environmental groups to achieve within the policy arena is to “fight fire with fire,” so to speak. Evidence that this type of action might be effective is provided by environmental activists Tim Breen (2001) when he notes, “conservative western Republicans with ties to extractive industries such as mining and timber latched onto the series to demand an investigation into the fund-raising practices and salaries paid to executives of the national groups.” Meier provides a nice summary of how these factors might affect regulatory enforcement.

The first step in attempting to predict influences on implementation is to determine how much autonomy exists within the policy arena. Meier states that the “key variables in determining the autonomy of the subsystem are the regulatory issues’s salience and complexity. Issue that are complex and issues that are not salient are generally left to the subsystem. Issues that are simple and issues that are salient attract political intervention” (1985: 34). In terms of this research, we expect that political intervention will be variable, and that this variation could produce variation in the implementation of the SMCRA. For the most part, while political influence is variable, the general lack of salience of coal mine regulation in most areas means that we should expect a the policy subsystem to be left in the hands of the implementing agency and the competing interests. Since I am looking for variation in state-level implementation, the affect of political interests and the advocacy coalitions will be important.

Meier notes that in most regulatory policy subsystems there will be two major coalitions, one which represents the interests of the industry and one that is opposed to those interests. The author then notes that “which coalition gains the upper hand depends on a series of variables. Coalitions that are large; have resources; and are dispersed, cohesive, intense, and broad have advantages over those that lack these characteristics” (Meier 1985: 35). Related to the resources available to the advocacy coalitions in affecting implementation is the question of the power equilibrium between those coalitions. Meier logically notes that in those policy subsystems which are dominated by a powerful industry interest, regulation is likely to benefit the regulated. And conversely, when the policy subsystem is dominated by the nonindustry coalition,

regulation is likely to benefit the nonregulated. Lastly, and perhaps most importantly, when the power equilibrium between the advocacy coalitions is balanced, regulation is likely to be balanced as well.

Much of my problem with the existing literature in the field is that it assumes a sort of industry dominated, agency capture vision of the policy subsystem which I think is a poor reflection of reality in the modern day. As such, many of our assumptions concerning the effects of political and socio-economic factors on implementation of the SMCRA may have to be adjusted to reflect this new reality. This is a subject which will be addressed in the next chapter.

CHAPTER III

RESEARCH DESIGN

In the preceding two chapters I have outlined a course of study for this dissertation which will address how implementation of the SMCRA answers five compelling questions regarding state level implementation of federal regulatory programs. Toward this end, I will employ two methods of inquiry which will examine the effect of competition between the affected interests within a policy arena on policy implementation. The two methods of analysis used in this dissertation will be a comparative method case study analysis, and a pooled time series statistical analysis. A discussion of the reasons surrounding the inclusion of these methods, as well as an identification of the data and hypotheses to be used in the analysis will comprise the remainder of Chapter III.

Methods of Inquiry

The first method which will be employed in this research design is a variation of the case study method, more commonly known as the comparative method. The advertised strength of the case study method is that it is able to provide a large amount of knowledge on a single subject. While very detailed knowledge about a specific case may be very useful to understand the function of that case, it does not produce much in the way of broader, more generalizable knowledge. The problem with some of the existing literature in the study of state implementation of federal regulatory policy is that

it tends to be too narrow in focus, much like the case study method. While a certain amount of care has been taken in this research design to avoid this situation by the inclusion of a pooled time series statistical method, problems exist with this type of analysis as well. A problem that can exist in using a pooled time series method only, is that it can be too generalizable, to the point to which one wonders if anything is actually learned about the specific cases being studied. The inclusion of the comparative method in this research design attempts to address both of these problems by combining some of the in depth knowledge available in a case study with a heightened level of generalizability that can only come through explicit comparison of cases. The use of the comparative method to establish the factors that should be included in the statistical model of this dissertation is a good choice for a couple of reasons.

The comparative method would allow an extension beyond the bounds of the normal case study method in that it would allow for direct comparison to take place between two or more states. One of the key problems with early literature in comparative political studies is that it was not explicitly comparative at all, but simply a detailed case study of an area which had not been studied before. In these cases the comparison is more implicit than explicit. For example, if one were to conduct an in-depth case study analysis of state-level implementation of the SMCRA in Wyoming in 1997, they would find a coal industry which leads the nation in both total and surface tonnage, a congressional delegation which ranks as the least environmentally friendly in the nation, and a regulatory program which produces very little in the way of enforcement activity. This is all very interesting, but presented as “stand alone”

information, it tells us very little about the influence of competition between the competing interests within the policy arena on regulatory enforcement. The inclusion of a comparative method analysis would allow the researcher to determine if these characteristics are unique to Wyoming, or if they are indicative of some underlying trend.

Secondly, by choosing the cases included in the examination, we can determine if variation exists in areas where we would expect variation to exist. While selection of cases can cause significant problems in statistical research, the use of careful case selection in the comparative method allows the researcher to make a baseline determination of difference between cases. Once this determination has been made, the use of a more rigorous statistical method can be used to determine the significance of that variation. The real question concerning the comparative method surrounds how the cases are selected.

The term “comparative method” is used to refer to two similar, yet subtly different research models; the most similar systems model and the most different systems model. While both models are commonly referred to as the comparative method, there are some subtle differences between the most similar systems and the most different systems models that are of note. The key difference between the models deals with the selection of the cases to be included in the model. In the most different systems approach, selection is based on cases in which the patterns among the majority of the variables in the model are different—or as it is commonly referred to in the literature—the majority of the variation lies on the independent variables. Meckstroth

notes that the logic of the most different systems design is to “identify [cases] that all have highly similar values on the dependent variable” (1975: 137). The rationale for using the most different systems design is based in the notion that “if, despite major differences of geographic location, very distinctive cultures, variation in economic structure, or even of the historic period under consideration, similarities in the factors under investigation can be observed these may be *prima facie* accounted for by the few similarities that remain” (Roberts 1978: 294).

By contrast, in the most similar systems approach, selection is based on cases in which the patterns among the majority of the variables is similar—or where the majority of the variation lies on the dependent variables. Clearly the two methods presented here are similar in many ways, in fact, Frensdreis contends that “the two strategies are shown ... to be identical in their logical structure, and neither strategy is found to be superior to the other in principle. Their sole differences lie in the amount of variability found in the dependent phenomenon and which independent variables this permits to be eliminated as irrelevant” (1983: 255). However, despite Frensdreis’ contention, there is some debate as to which of these two methods is most appropriate for comparative research.

The most prominent arguments for using the most similar systems approach instead of the most different systems approach are offered by Dogan and Pelassy, and Roberts. Dogan and Pelassy note that by using the most similar systems approach, “researchers seek the most stable, and invariant factors amid a profusion of forms and events. That is why they look more for similarities than for differences... Comparison helps separate the accidental from the inevitable, the occasional from the regular” (1984:

19). The point being made by Dogan and Pelassy is that a comparison which seeks to identify a small amount of differences in two very similar systems is a much more “stable” enterprise than looking for a few similarities in two vastly different systems. Roberts takes a similar approach when he notes, “the advantage of using a ‘most similar’ approach is that, where the problem is one of identifying and accounting for specific differences, selection of units for analysis which possess many similarities in terms of relevant variables makes easier the identification of variables which do differ, and which may thus be considered as the first candidates for investigation as causal or explanatory variables” (1978: 293). The argument that is being made here is that since we are seeking to explain variation, the variation should exist on our explanatory (or dependent) variables.

While the arguments for the most similar systems approach are compelling, Meckstroth argues that the claims in favor of Przeworski and Teune’s (1970) most different systems approach “warrant careful attention since they appear to be much stronger than those that can be made for the ‘most similar systems’ design” (1975: 136). By way of undermining the most similar systems approach in favor of their most different systems approach, Przeworski and Teune argue that “although the number of differences among similar countries is limited, it will almost invariably be sufficiently large to ‘overdetermine’ the dependent phenomenon... there is more than one factor that ranks Great Britain, Australia, the United States, and Canada in the same order; there is more than one difference between the United States, Great Britain, and West Germany, on the one hand, and Italy and Mexico on the other” (1970: 34). Basically, the argument

laid out by Przeworski and Teune is that it is best to use a system which maximizes variation, and then eliminate those independent variables in which there is a great deal of difference as possible explanatory variables. Their logic being that there are many more differences between systems than there are similarities, and that by eliminating those differences as possible causal influences, the researcher is able to more precisely make causal determination.

While Przeworski and Teune's critique of the most similar systems approach is well thought out, Lijphart contends that "this [Przeworski and Teune's] criticism is valid, although the problem of overdetermination can be alleviated by the imaginative selection of additional cases, particularly at the subnational level" (1975: *no page number*). Similarly, Roberts contends that the problem of overdetermination associated with the most similar systems approach can be controlled "by a second-stage inquiry involving a 'most different' selection of cases as a means of narrowing the range of possible explanatory factors" (1978: 297). So which system is best? The question is really one that is dependent upon the theoretical questions which are being asked and the data which is available. In many respects the methods are interchangeable, but the subtle differences between the models must be accounted for in order to ensure the quality of the research being performed.

So which is the appropriate design to use in this dissertation? The simplest and most honest answer is that I don't know, and to tell the truth, I am not convinced that Lijphart, Dogan and Pelassy, Przeworski and Teune, or Meckstroth really know either. So the answer is that I am going to use a mixture of the two. I will perform a pair of

most similar systems studies. In one group I will include an analysis of two similar states in the eastern region, and in the other group I will analyze two similar states in the western region. I will then compare the results of each analysis in a sort of most different systems study. I think that there are several reasons to approach the qualitative analysis of this dissertation in this manner. The first reason is that I can avoid the problems associated with both the most similar and most different systems methods by doing what amounts to both. Second, the in depth knowledge of the implementation function within each state, which is inherent in the comparative method would lend an improved level of accuracy to any findings that would follow using subsequent, more quantitative methods. Third, the use of the largely qualitative comparative method in conjunction with some more statistically based quantitative measures provided in the subsequent method of this dissertation would provide a multiple measure approach to research design, which aids in broad acceptance across subfields within political science.

In terms of statistical analysis using this type of data, the common approaches which can be used are cross-sectional analysis, time series analysis, and pooled time series analysis. Much of the existing literature on the topic of surface mine regulation focuses on the first two methods, so they are worthy of mention in this section.

This first statistical method that is often used in the study of regulatory policy is the simple cross-sectional analysis. This method is frequently used because it offers a good level of explanation, with a minimum level of data gathering. In the use of this method, the only data that needs to be obtained is a cross-section of variables for different units at one point in time. In using this method, the researcher can make

inferences about the effects of state specific influences on the level of implementation of the SMCRA. Much of the existing literature on implementation of the SMCRA (Scheberle 1993, Hedge et al 1991, Davis et al 1989, Hedge et al 1988) utilized cross-sectional analysis. The weakness of this method is that it does not allow you to make inferences about the effects of change within a specific state over time.

In order to make that type of inference, a time series analysis is required. In a time series analysis, data needs only to be gathered for the list of independent variables within a single unit of analysis over a certain period of time. In using this model, the researcher is able to make inferences on how factors within a specific state can affect levels of implementation as they vary over time. The strength of this model is that it allows you to make longitudinal inference using your data, which gives you greater predictive power. The weakness of this model is that it only allows for variance within one state, and is therefore not generalizable to other states. In order to make that type of inference a third type of statistical analysis is necessary. Examples of existing literature examining implementation of the SMCRA which employ a time-series design include works by Beck (1993), Dernbach (1993), Dragoo (1993), Vestal (1989), Nielson (1989), and Menzel (1989).

The third type of statistical method that is commonly incorporated in research designs is the pooled time-series design. The short description of the pooled time-series model is that it is a statistical combination of the two previous models listed. A pooled time-series shares the strengths of the cross-sectional model and the time series model, without carrying the limitations of each model. If it is your desire to provide explanation

of how the variables in the model will affect the dependent variable both within a given system over time, as well as across systems, the pooled time series model is often the most appropriate method.

The problem with running a pooled time-series model is essentially twofold. First, there are almost always problems with heteroskedasticity and autocorrelation in these models. Secondly, the data requirements to run such a model are substantial. Heteroskedasticity and autocorrelation are non-spherical disturbance patterns, which often appear in statistical modeling. Heteroskedasticity, most often associated with cross-sectional models, occurs when the error terms are correlated with the variables in the models. In contrast, time series models usually suffer from autocorrelation. Autocorrelation indicates that the error terms for the model are not random and fixed zero, but that they are correlated with one another across time. Since pooled time series models are simply a statistical unification of these other two approaches, these problems become very prevalent.

The second problem with running pooled time series analysis is that it takes a large amount of data to run. Not only do you need to collect the cross-sectional data on all of the theoretically important variables, but you also need to collect them over a period of time for each unit of analysis in the study. In the case of this study, the data were collected using a series of US Census data, Bureau of Economic Affairs data, and aggregated data provided by the US Office of Surface Mining. Once the data are collected, the model is fairly straightforward, with some correction techniques applied to control for the non-spherical disturbances. The power of inference gained from a

properly constructed pooled time series using carefully thought out conceptualizations of the relevant variables is greater than that which is available using simple cross-sectional or time series techniques.

The variables of interest in this dissertation will be tested in Chapter V using a pooled time-series analysis. The reason that this method was chosen is because I am seeking to explain variations in implementation that will occur both cross-sectionally (between states) and over time (within states). Furthermore, I have sufficient data to employ this technique. The results of the pooled time-series analysis will be used to determine whether or not there is evidence of variation due to bureaucratic discretion—from political, economic, or interest group sources—present within the model. Given that the existing literature in the field suggests that bureaucratic discretion triggered by political and environmental influence is the reason for state level variation in enforcement of the SMCRA, we would expect variation to be present in the model. While this technique has been employed in the study of implementation of the SMCRA in some of the existing literature (Woods 2003, Quinn 1993, Hedge and Scicchitano 1994, Hedge et al 1993, Mutz and Daniels 1993, Hedge et al 1989), the value added in this dissertation is that the panel of data includes all 24 states with primacy over implementation of the SMCRA for a much longer time period (1978-1997) than has previously been studied.

The stated purpose of this dissertation being to outline a course of action which is to advance, and develop a method for testing several theoretical assertions concerning variations in the level of “enforcement vigor” (Thompson and Scicchitano, 1986)

exhibited by the states in the implementation of the Surface Mining Control and Reclamation Act of 1977, I feel that the incorporation of both methods is warranted.

Data

The hypotheses to be tested in this dissertation utilize data collected from relevant federal and state agencies, the League of Conservation Voters, and numerous published sources. The majority of the data were supplied by the Office of Surface Mining within the U.S. Department of the Interior. The main source of data collected from the Office of Surface Mining was the 1997 Annual Report. The 1997 Annual Report included information relevant to production and enforcement activities for the first 20 years of implementation of the SMCRA (1978-1997). Additional information regarding production and enforcement activities for the states involved in the comparative method analysis were provided by the respective state offices of surface mining. A number of economic indicators utilized in the dissertation were provided by the Bureau of Economic Analysis within the U.S. Department of Commerce, and the Energy Information Administration within the U.S. Department of Energy. While the federal government imposes common reporting requirements on these agencies, the requirements were not uniform for the entire length of the study. In cases where the unit of analysis had changed over time, corrections were made to ensure a common unit of analysis over the entire length of the time series. Data concerning environmental interest strength were obtained from the Annual Scorecards of the League of Conservation Voters. And lastly, data concerning political ideology were obtained from a dataset

compiled by Berry et al (1998), housed within the University of Michigan's Interuniversity Consortium for Political and Social Research database. Specifics concerning the hypotheses to be tested in this dissertation, as well as the data utilized to test said hypotheses will be discussed in the next two sections of this chapter.

Hypotheses

As discussed in the first two chapters of this dissertation, the hypotheses to be tested revolve around an examination of how state-level enforcement of the SMCRA relates to five relevant questions concerning enforcement of regulatory programs. As such, the hypotheses will be addressed in terms of how they relate to the questions covered in Chapters I and II.

The first question of relevance to this dissertation concerns whether or not there is discretion present within the implementation of federal regulatory programs. The question of discretion is central to idea of political and economic influence. The reason being, if there is no discretion present in implementation, then variation in enforcement would likely be caused by variation in levels of infraction. This circumstance would be ideal in terms of creating regulatory programs which are impervious to outside influence, but given the history of the establishment of the SMCRA, and the logic behind the notion of granting state primacy over federal regulatory programs, this circumstance hardly seems likely. So the first priority in terms of the analytical section of this dissertation is to establish the existence of variation, following the logic that

variation in enforcement is likely to be a sign of discretion. As such, the first hypothesis to be tested can be stated as follows:

H1: The lesser the amount of variation present within state-level enforcement of the SMCRA, the lesser the level of discretion available to the implementing agency.

While this is a bit of a theoretical leap, given that there are many factors which can influence state-level enforcement, the presence of discretion is necessary to establish the possibility of that influence being due to political and economic factors.

The second question that is of importance to this dissertation concerns the effect of federalism on the amount of discretion that is present within the implementing agency. The logic behind this question stems from the idea that a federal regulatory program that is run by a single federal implementing agency representing a single interest is likely to provide less opportunities for discretion in action than a federal regulatory program which is run by 24 separate implementing agencies that represent 24 varied interests. Therefore, the second hypothesis can be stated as follows:

H2: Those states that have achieved primacy will have a greater amount of discretion present in implementation of the SMCRA.

This notion does not involve the theoretical leap that the first question does. If there is not greater discretion present within the various state-level agencies implementing the SMCRA, then the only reason for the federal government to grant primacy would be as a cost savings measure. And if the states were only able to pick up the financial obligation

of the federal government in achieving primacy, and were not given any greater discretion, then there would be no incentive for the states to achieve primacy.

The third question examined in this dissertation involves the role played by political factors, at both the state and national level, on state-level enforcement of the SMCRA. The rationale for national-level factors influencing state-level implementation involves the very nature of the idea of partial-preemption itself. Partial-preemption—or primacy, or cooperative federalism—is based upon the notion that the federal government will oversee implementation at the state-level, and can intervene in state-level enforcement when necessary. While it is possible for any political power at the national level to potentially affect implementation under a partial-preemption program, it is much more likely to be caused by presidential influence, given that the president is the “chief executive” and rightful overseer of the bureaucracy. Given this notion, the hypothesis concerning national level political influence can be stated as follows:

H3: Enforcement activities will be greater during a Democratic presidential administration than during a Republican presidential administration.

The logic behind this hypothesis concerns the nature of partisanship. The partisanship theory suggests that Republican presidential administrations are less likely to favor government involvement in business activity through regulation than Democratic presidential administrations. As such, we would expect to see a lower level of enforcement activity during these administrations.

The second part of the partisanship theory concerns the effect of state-level political influences on the implementation of the SMCRA. State-level political

influences are considered to be much more likely to affect the enforcement levels exhibited by the implementing agency, given the nature of partial preemption. This being noted, the hypothesis concerning the impact of state-level political factors on implementation of the SMCRA can be stated as follows:

H4: The more liberal the ideology of the state, the greater the level of enforcement exhibited by the implementing agency within said state.

The logic behind this hypothesis is very similar to that of hypothesis three. Given the nature of partisanship theory, and the general disdain for regulation displayed by most who would be categorized as conservative, we should suspect those states who are more liberal to show higher levels of “enforcement vigor.”

The effect of economic factors and market forces comprise the fourth area of concern in this research design. As discussed in Chapter II, the impact of economic forces on regulation is a matter of great study within the area of regulatory politics. Like the partisanship theory, the impact of economic and market forces on the implementation of the SMCRA can be measured in two ways. The first measure examines the impact of a states economic dependence upon the industry being regulated. The hypothesis concerning this concern can be addressed as follows:

H5: The greater a state’s economic dependence on coal as a resource, the lesser the enforcement activities exhibited by said state’s implementing agency.

The idea here is a simple one. Economic theories of regulation often posit that strict regulation of an industry hinders that industry in some way. States that are more

dependent upon the coal industry as a resource are going to be less likely to hinder the coal industry through strict regulation.

The second part of the economic theory of regulation being tested in this dissertation deals with the impact of market forces on implementation of the SMCRA. Market forces deal with the production capacity and the profitability of the industry being regulated. In terms of measuring the impact of market forces on state-level enforcement of the SMCRA, the hypothesis can be stated as follows:

H6: The higher the production capacity of the coal industry within a state, the higher the level of enforcement activity exhibited by the implementing agency within that state.

The thought process behind this hypothesis deals with the link between productive capacity and profitability. The higher the productivity demonstrated by the coal industry, the higher the profit margin. If profits are high, then the implementing agency is more likely to strictly regulate the industry.

The last area of concern dealt with by this dissertation is the effect of competition within the policy arena on the implementation of the SMCRA. The rationale behind this question deals with the degree to which either the coal industry, or the environmental movement has an advantage within the policy arena. In states with a strong environmental movement, and a weak coal industry, we would expect the environmental movement to have an advantage, and we would expect high levels of enforcement. Conversely, in states with a strong coal industry, and a weak environmental movement, we would expect low levels of enforcement. And lastly, in states where there is

competition among the two competing interests, we would expect similarly moderate levels of enforcement activity. The hypothesis concerning the impact of competition on the “enforcement vigor” exhibited by the state implementing agency can thus be stated as follows:

H7: The higher the level of competition between the opposing interests within the policy arena, the more moderate the enforcement of the state’s implementing agency.

The expectation here is that most states will have a relatively high level of competition between the competing interests. Much of the early literature in the field assumed an industry dominance of the policy arena, but the environmental policy literature clearly states that environmental causes carry large amounts of public support (Vig and Kraft 2003, Guber 2003, Kempton et al 1995, Ladd and Bowman 1995, Ringquist 1993b, Dunlap 1991). Therefore, the only instances where we would expect there to be a lack of competition is in cases where either the environmental movement is very strong coupled with a weak coal industry, or vice versa.

With these hypotheses serving as a basis, the dependent and independent variables to be examined in this dissertation have been chosen. The variables of interest will be examined using each of the methods discussed earlier in this chapter.

The Dependent Variables

Given that the key area of concern in this research surrounds how competition among the effected interests within a policymaking arena affects enforcement activity,

the dependent variable for the model will be the level of “enforcement vigor” demonstrated by the states. The term “enforcement vigor” as supplied by Thompson and Scicchitano (1986) refers to the stringency of each state’s enforcement of federal surface mine regulations. For the purposes of this dissertation, “enforcement vigor” is going to be measured by examining the three courses of action that are available to a state Office of Surface Mining to correct the actions of coal producers. Those courses of action are as follows: (1) inspections, (2) notices of violation, and (3) cessation orders. Since these actions vary in degree of severity, at least three separate models will need to be generated to determine the effect of each of the independent variables upon the individual dependent variables.

According to the provisions of the SMCRA, those state agencies that have achieved primacy are required by law to inspect each mine, or “inspectable unit” a minimum number of times each year (the actual number of inspections mandated by OSM has fluctuated during the time period of this study—1978 to 1997—from as many as twelve to as few as two). If these inspections were carried out as mandated in actual practice, then including the number of inspections as a dependent variable would be unnecessary; however, in reality this is almost never the case, and a cursory examination of the data reveals that there is wide variation in the rates of inspection across states (Desai 1989b; Davis et al 1989; Scicchitano et al 1989). That is why I feel that it is important to include a model with the number of inspections per mine as a dependent variable. While I have dealt its inclusion important to the understanding of variation in enforcement vigor in implementation of the SMCRA, it is hypothesized that the

independent variables will have little or no effect on the level of inspections, since inspections alone carry no punitive measure.

The second dependent variable in the study represents the second course of action which may be taken by a state agency in terms of surface mine regulation, the issuance of a notice of violation (NOV). Notices of violation must be issued when any violation is observed during the inspection process. The law mandates that inspectors have no discretion in this matter. This means that the key enforcement mechanism available to state agencies in enforcement of the SMCRA is the notice of violation. One question that remains from previous studies dealing with SMCRA implementation is how notices of violation are to be measured. Some previous research in the field measures notices of violation per inspection (Woods 2003). The logic being that since every violation observed should be cited, that a similar number of inspections should lead to a similar number of notices of violation. A second school of thought on the subject claims that notices of violation should be measured per mine (Desai 1989b; Davis et al 1989; Scicchitano et al; 1989). The rationale for the utility of this measure is that it is better able to control for the possibility that there is some systematic variation in rate of inspection amongst the states. With no clear theoretical winner in place, the second and third models tested in this dissertation will include notices of violation per inspection and notices of violation per mine, respectively as the dependent variable. If there is variation in pressure being exerted on state agencies implementing the SMCRA, it should be present in this measure.

Once a notice of violation has been issued, if the mine does not satisfactorily address the violations outlined in the NOV within a certain time frame (90 days), then the agency can issue a failure to abate cessation order (CO). A cessation order is clearly the most punitive course of action which can be taken, and as such are fairly rare occurrences. Nevertheless, the fourth model which will be tested in this dissertation will use cessation orders per mine as the dependent variable. Given the severe punitive nature of a cessation order, coupled with its rarity, it is hypothesized that there will be very little variation between states in terms of numbers of cessation orders issued.

The immediate question that comes to mind is whether or not all four of these dependent variables are necessary. It is my contention that all four need to be examined to determine if variation in implementation can, in fact, be attributed to political pressure, economic influences, or competition within the policy arena, because the incentives behind the use of each measure are different.

The Independent Variables

The independent variables that I want to talk about first are those which are most closely tied to the central hypotheses of the dissertation. Those hypotheses are those which deal with the affect of competition among the competing interests within the policy arena, and how that competition might affect implementation of the SMCRA. The selection of the appropriate measures to represent these variables is key to the analysis presented in this dissertation. The problem is that it is often very difficult to quantify an advantage in power position of one advocacy coalition over another. I will

attempt solve some of this problem with the inclusion of the largely qualitative comparative method case studies in Chapter IV. In terms of the quantitative study presented in Chapter V, there are two variables which I think are important in demonstrating the relative power positions of both the industry backed advocacy coalition and the non-industry (environmental) coalition within this particular policy arena. Those variables are state level economic dependence on coal as a resource, and the corresponding League of Conservation Voter (LCV) score for each state. Each of these variables provides us with some leverage over the factors which might affect competitive balance within the policy arena.

Economic dependence is a likely source of influence over state implementation of protective federal regulatory policy due to an increase in the likelihood of state capture of the regulatory agency, based upon that states dependence on coal dollars as a resource. This variable will also provide us with a baseline with which to infer the relative strength of the advocacy coalition supporting the industry within the policy arena surrounding the implementation of the SMCRA. The measure which is to be used to establish a state's dependence on coal dollars as an economic resource will be the percentage of said state's gross state product (GSP) attributable to the coal industry.

A state's GSP is an economic measure that is often seen as being roughly equivalent to the gross domestic product (GDP) for the nation. The GSP is defined by the Bureau of Economic Analysis in the following way:

GSP is the value added in production by the labor and property located in a state. GSP for a State is derived as the sum of the gross state product originating in all industries in a State. In concept, an industry's GSP, referred to as its "value added", is equivalent to its gross output (sales or receipts and other operating

income, commodity taxes, and inventory change) minus its intermediate inputs (consumption of goods and services purchased from other U.S. industries or imported). Thus, GSP is often considered the state counterpart of the nation's gross domestic product (GDP), BEA's featured measure of U.S. output.¹³

The logic in using this measure as an indicator of a state's dependence upon coal as a resource is that it measures the proportion of income that can be directly attributed to the coal industry within a state.

The second measure which deals with the central hypothesis of this thesis is a measure of environmental interest group strength within each state. This variable is the one that provided me with the most difficulty in the compiling of data for this dissertation (which is saying something as many of the variables provided me with difficulty). My initial instinct was to use some sort of membership data provided by a collection of relevant environmental interest groups (Sierra Club, Greenpeace, Environmental Defense Fund, etc.). The problem associated with the use of these measures is that there are periodic spikes in membership that confound the general trend in growth of the environmental movement. This problem is demonstrated by serious spikes in pro-environmental interest group membership associated with President Reagan's inauguration and subsequent attack on the Environmental Protection Agency. Clearly these spikes occurred due to a specific perceived threat, and had little to do with a rise in environmental awareness generally—or with coal mining specifically. In the end, I chose to measure the strength of the environmental movement in each state by using the corresponding League of Conservation Voters (LCV) score for said state. The

¹³ This definition of GSP comes from the Bureau of Economic Analysis' web page which can be found at URL- <http://www.bea.gov/bea/regional/gsp/help/OnlineHelp.htm>.

choice of this variable is admittedly not perfect, but it was chosen due to the fact that it represents the political advocacy associated with the environmental movement within each state. And, in fact, that is what I am seeking to measure. The impact that environmentalism has over political influence based upon each state. The measure that was chosen was the average score of each member of the state's congressional delegation (both the House of Representatives and the Senate) for each year of the study. This information was available in hard copies of the League of Conservation Voters Annual Congressional Scorecard. This score is based upon a subjective measurement of what the "pro-environmental" stance is on each environmental issue voted upon by congress within a given year, and then determining the percentage of the time that each member of congress voted "pro-environment". As such a high score would demonstrate a consistent record of "pro-environmental" voting, and a low score would indicate a record of "anti-environmental" voting.

The next two variables in the model are those which deal with hypotheses related to the question of the effect of political influence on implementation of the SMCRA. The *partisanship* hypothesis is defined by (Thompson and Scicchitano, 1986), and suggests that the political partisanship of a state will have an impact on implementation of the SMCRA. This hypothesis is based on the political presumption that the ideology concerning regulation of business, specifically, and federalism, in general, differs between Republicans and Democrats. The assumption is that partisan Republican states will be more likely to oppose the "concentration of power in Washington and excessive business regulation by government" (Thompson and Scicchitano, 1986). Therefore, an

indicator of state government ideology must be based on something more substantial than just the percentage of democrats and republicans in state government. One such indicator is the one established by Berry et al (1998). In the abstract of their 1998 article “Measuring Citizen and Government Ideology in the American States, 1960-1993” which appeared in the American Journal of Political Science, Berry et al describe their indicator of ideology:

We construct dynamic measures of the ideology of a state’s citizens and political leaders, using the roll call voting scores of state congressional delegations, the outcomes of congressional elections, the partisan division of state legislatures, the party of the governor, and various assumptions regarding voters and state political elites.

As the partisanship hypothesis in this dissertation serves as a proxy for ideological beliefs in the first place, this measure of state level ideology seems to be warranted. In terms of numerical value, a score on the Berry et al index of zero represents the most conservative value, and a score of one hundred represents the most liberal value.

Another key variable which is placed into the model concerns a national level political effect on the implementation of the SMCRA. That variable is a presidential dummy variable which is included to account for variation in implementation vigor between Republican and Democratic presidents. As has been discussed earlier in the paper, the expectation is that Republican presidents will be less likely to pursue large-scale industry regulation than would Democratic presidents. There are a number of acceptable methods for coding the presidential dummy variable. One acceptable method is to simply code it as a one for a Republican president, and a zero for a Democratic president, or vice versa. While this is theoretically acceptable, there is also some

justification in the literature for a different technique. This technique would provide a dummy variable for each president, excluding one of course to avoid the “dummy trap.” The argument supporting the use of this measure posits that it would allow for variation among different presidents of the same party. For example, Ronald Reagan’s views toward the bureaucracy were certainly more hostile than were George Bush’s, even though both were members of the Republican Party. In addition, as Wood and Waterman (1994) have pointed out, individual presidential influences can have an effect on policy implementation. The argument against using this seemingly more theoretically justifiable measure is mainly methodological. The problem with the more specific measure is that it greatly restricts the model by in essence creating a fixed effect for presidential administrations. Since the aim of this dissertation is to explain state-level variation in implementation, and this measure captures the affect of national level influences, perhaps this constraint is too severe. The purpose for including the variable in the model was to capture the possibility of national level influence, but that influence on varies over time, not between units. As such, the first, less restrictive measure for presidential level influence is the one which will be included in this model.

The next two variables presented in the model are included to measure the impact of economic and market forces on SMCRA implementation. The first indicator associated with the impact of economic forces is a measure of the average mine-mouth coal price. The average mine-mouth coal price for each state will provide us with some measure of the amount of money at stake in regulation of the industry, by providing us with an idea of the relative demand for the goods produced by that industry based upon

average price over time. This indicator was compiled by examining a list of average mine-mouth coal prices per short ton of coal mined within a given state, which appear in back issues of the annual energy review (AER) distributed by the Energy Information Agency within the U.S. Department of Energy.¹⁴ The rationale behind this indicator has to do with the perceived strength or weakness of an industry based upon the price that said industry's product commands on the open market. In the time period of this study, the average mine-mouth coal price has dropped on national average. This would seem to indicate a gradual weakening of the coal industry over time. However, there is also variation in mine-mouth coal price across units. Generally, the coal mined in the eastern region is of higher quality, and is thereby worth more per short ton than the coal mined in the western region. There are a couple of ways to look at this information. One could conclude that if the price of coal is low—whether due to the effect over time or across units—that it is indicative of a weak coal industry, so there would be some incentive for the regulatory agency to ease enforcement in an effort to support the weakening industry. The second way to look at this indicator is that it may be indicative of a reasonable, and more valued alternative in the open market. If this low average mine-mouth coal price is due to a readily available substitute in the market, then we should expect no help from the regulatory agency.

The second variable related to the impact of economic and market forces serves two purposes. First it serves as an indicator of the effect of market forces on enforcement of the SMCRA, and second it serves to capture regional variation present

¹⁴ I owe a great debt to Mr. Michael Mellish at the U.S. Department of Energy for providing me with an Excel file which contained the above information, along with hard copies of the annual energy reviews for the time period of this study (1978-1997).

within the model. The measure is that of productivity. The productivity measure is provided by the annual energy review compiled by the U.S. Department of Energy. The measure for each states productivity is a measure of short tons of coal produced per miner per hour.¹⁵ In terms of how productivity relates to the economic effect of market forces, it can be seen as a measure of the profitability of the industry. The logic being that as productivity increases, profitability increases. This relationship has been discussed already in this chapter. In terms of how productivity captures regional variation, most of the coal mined in the western region is mined using surface mining techniques—which is far less labor intensive than underground mining—whereas a substantial proportion of coal mined in the eastern region still comes from underground mines.

The last variable which will be included in the model—and the only one which serves solely as a statistical control—attempts to capture some of the regional variation present between the two major coal producing regions in the United States. The variable in question is a measure of the percent of a state's total production which is attributable to surface mining. Since the SMCRA is a law which seeks to regulate the surface mining of coal, some indicator needed to be included in the model to account for variation among the states in terms of mining method. A good example of this is provided by examining the two largest coal producing states, Wyoming and West Virginia. Nearly all of Wyoming's more than 300 million tons of coal mined each year comes from surface mines, while only about half of West Virginia's 150 million tons

¹⁵ The Department of Energy notes that this figure is calculated by dividing the total production for each state by the total labor hours worked by all mine employees except office workers.

come from surface mines. This variation could produce a substantial impact on the regulatory enforcement exhibited by each state in terms of the SMCRA. While both states are fairly dependent on coal dollars for their economic resources, strict regulation in West Virginia would only affect half of their mining capacity, while it would affect nearly all of Wyoming's capacity. The measure for percent of coal production attributable to surface mining is simply calculated by dividing the surface tonnage by the total tonnage produced. This information is available in the annual reports compiled by the Office of Surface Mining within the U.S. Department of Interior. Descriptive statistics for the data tested in the subsequent chapters of this dissertation are presented in Table 3.1.

Table 3.1—Descriptive Statistics

Variable	Number of Observations	Mean	Standard Deviation
Inspections Per Mine	469	37.732	42.075
Notices of Violation Per Mine	472	2.484	4.310
Notices of Violation Per Inspection	410	0.088	0.158
Cessation Orders Per Mine	470	0.399	1.080
State Government Ideology	474	49.217	20.022
% State GSP Coal	474	1.291	2.612
LCV Score	474	40.595	17.262
Percent Surface Mines	474	74.408	30.108
Production	474	5.289	5.449
Average Mine Price	298	13.508	6.794

Armed with a set of hypotheses, and the data to test them with, the remainder of this dissertation will be organized in the following manner. Chapter IV will comprise a comparative method analysis of four coal producing states, two in the eastern region and two in the western region. The states that will be included in this analysis are Montana and Wyoming in the west, and Kentucky and Ohio in the east. Chapter V will consist of the pooled time series statistical analysis of all 24 coal producing states for the time period of the study—1978 to 1997. Chapter VI will conclude with a discussion of the results of the analyses completed in Chapters IV and V, along with a summary of any conclusion which can be drawn from the research.

CHAPTER IV

COMPARATIVE METHOD ANALYSIS OF SMCRA ENFORCEMENT

Chapter III of this dissertation outlined a course of study, and a series of hypotheses to be tested to examine variation in state-level enforcement of the Surface Mining Control and Reclamation Act. The first stage in the study outlined in Chapter III was to conduct a comparative method case study analysis of SMCRA enforcement, which will be the focus of Chapter IV. The comparative method of analysis is a term which is commonly used to describe either of a pair of similar methods, the most similar systems design and the most different systems design. In Chapter III, a detailed description of each method, as well as the common arguments in favor of using one method over the other was given. The choice of method for the analysis presented here in Chapter IV will be a sort of mixture of the two methods discussed.

I will first conduct a pair of most similar systems analyses, to determine the effect of the variables of interest on the five questions of importance to this research design. The states chosen for this first stage of analysis will be taken, two each, from each of the major coal producing regions in the United States. I will then compare any theoretically relevant results found in the first two most similar systems analyses in the second stage, which will constitute a form of most different systems analysis. In mixing the two methods, I should be able to maximize the strengths of each method, while minimizing the weaknesses. A thorough discussion of the method of analysis, along

with a discussion of the specific cases chosen for inclusion will be provided in the next section of this chapter.

Method

As discussed in Chapter III, the form of comparative method analysis that will be used in this chapter will be a mixture of the most similar and most different systems methods. The first step in the analysis will be to determine the criteria by which I will attribute similarity and difference. From the most basic standpoint, I have chosen to divide the states which produce coal into two groups based upon their common similarities. There are many ways to divide the groups, but the one that I have chosen deals with regional variation.

The regional variation method of categorization is based upon the idea that mining operations differ sufficiently on several key variables based upon region, that expectations concerning enforcement activity should be expected to change as well. There are a couple of ways to determine regional variation in terms of coal mining in the United States, and as such some discussion of each method should be discussed. Both methods agree that the division is due to substantial differences between regions on such important variables as topography, method of extraction, size of the mines, number of mines, type of coal, and ease of reclamation. The disagreement seems to be on into how many regions to divide the country.

Some of the existing literature states that the coal producing states should be divided into three separate regions based upon variation on the variables mentioned

above. One such article is by Scicchitano et al (1989). They choose to divide the country into an eastern, a mid-western, and a western region. Their argument is that there is sufficient enough variation between the states to warrant the inclusion of the third group. The more traditional way to divide the groups is to simply divide the states into two regions—east of the Mississippi River, and west of the Mississippi River—based upon variation on the same variables listed above. This is the method of separation employed by the Office of Surface Mining and the Department of Energy in their data reporting. I have chosen to divide the states into two groups for a few reasons.

First, and most importantly, I feel that the majority of the variation can be captured in the two group method. Secondly, since the federal agencies charged with oversight see fit to divide the states into only two groups, I feel that this division is sufficiently stringent. Thirdly, since I am planning on conducting two distinct most similar systems analyses, and then comparing the two in a sort of most different systems analysis, the separation of the states into two groups fits my design better. That said, the variation between my two regions, being key to my claim of the states involved being “most similar”, should be discussed.

The coal producing region east of the Mississippi River is distinct from the region to the west of the Mississippi River on several key dimensions. The first difference of note between the two regions deals with the topography of the land. In the eastern region, the majority of the coal deposits are found in somewhat steep, hilly terrain. This type of terrain makes mining operations, whether underground or surface, more difficult. In terms of surface mining, the major problems with this sort of terrain

lies in finding appropriate places to store the displaced material. Traditionally, coal operations in this region would have simply used the displaced material to fill a valley between two mountains. However, it was just this type of activity that served as a major impetus for the passing of the SMCRA in the first place. The problem with valley fill mining is that the displaced material not only contaminates the water that flows in the valleys, but in effect creates large, unstable refuse dams as well. Related to these problems is the fact that it is much harder to restore the land to its original contour in the eastern states due to the topography. By contrast, the majority of mining done in the western states does not face the same type of problems, because the topography of the land is much more conducive to surface mining operations.

A second, related condition which contributes to the importance of regional differences in coal producing states deals with the size of the coal mines present within the region, and subsequently, the number of mines. Coal mines in the eastern region states tend to be much smaller than the mines in the western states, and consequently, there tend to be many more mines in the eastern states. This can have an effect on SMCRA enforcement activity in a couple of ways. First, smaller mines are indicative of smaller operations, and thereby decreased capacity to properly abide by all restrictions levied by the SMCRA. Rosenbaum (1987) notes that the larger coal operations are more capable of absorbing the costs associated with ensuring the environmental integrity of mined land that is required by the SMCRA. If this is the case we should expect to see a higher level of enforcement activity in the region with the smaller coal operations, in this case the eastern region. Secondly, smaller mines often mean a greater number, and more

varied nature of the mines being regulated. The implication being that it is much more difficult to regulate a large number of small mines than it is to regulate a small number of large mines. This should also lead to a higher level of enforcement activity in the eastern region.

The next key difference between our coal mining regions deals with method of extraction. As I have noted before, the two main methods of extraction employed by the coal industry in the United States is underground mining and surface mining. Since the SMCRA is concerned with regulating the effects of surface mining operations, a regional discrepancy in method of extraction should be expected to have an impact on enforcement activity. In terms of the regions selected for our study, the coal produced in the eastern region often comes from a roughly even mixture of underground and surface mining. By contrast, the coal produced in the western region comes almost exclusively from surface mining.

Taking into consideration all of this variation among the coal producing regions, my most similar systems analyses will be constructed in the following manner. I will select two states from each region—Ohio and Kentucky in the east, Wyoming and Montana in the west—and conduct separate most similar systems analyses on each pair. Once the impact of the variables of interest have been established in each of the most similar systems analyses, I will then compare variation between the two systems in a sort of most different systems approach. By doing so, I should be able to establish a fairly strong *prima facie* case regarding the impact of the variables of interest on implementation of the SMCRA.

In terms of the specifics of the data analysis presented in this chapter, the following method will be employed. For each of the variables of interest I will calculate a mean score for each state for the time period of the study. I will then compare the mean scores for each state to determine if the variables for the respective states are similar or different. Claims of similarity and difference will be made based upon the calculation of a simple comparison of means t-test score for each of the samples. In terms of this calculation, a t-test score which produces a corresponding probability of less than .05 will be considered to be statistically significantly different. Consequently, those comparisons which yield a t-test score which produces a probability of greater than .05 will be considered to be statistically significantly similar. Adapting this to the logic of a most similar systems analysis, states within the same region—for example, Ohio and Kentucky in the eastern region—will be expected to produce significantly different scores in terms of enforcement activity. By extension, those variables of interest which also produce significantly different scores will be considered to be possible causes of the variation in enforcement activity.

And of course, this method will examine SMCRA enforcement activity through the framework of the five questions introduced in Chapters I, II, and III of this dissertation. The first two questions deal with the issue of discretion in state-level implementing agency action.

Is There Discretion Present in State-Level SMCRA Enforcement?

In terms of the analysis presented in this dissertation, two of our five questions of relevance are so closely linked, that they are nearly impossible to separate. These are the questions of whether or not discretion is present, and if so, does discretion exist at the state-level. The reason these questions are so hard to separate in this research is because, for better or worse, the SMCRA is enforced at the state-level using the implementation strategy of partial pre-emption. Therefore, if any variation exists, then it must exist at the state-level. Of the five questions of relevance to implementation of the SMCRA that are presented in this dissertation, these are perhaps the easiest to answer, but the most difficult to provide compelling evidence for.

The question of whether or not discretion is present in state-level SMCRA enforcement is one that has been addressed variously in the existing literature (Woods 2003; Thompson and Scicchitano 1986; Desai 1989b; Davis et al 1989; Scicchitano et al 1989; Harris 1989), and the conclusion is always the same. In the existing literature, as well as in this dissertation, the notion of discretion is tied to the existence of variation in enforcement activity between the states. The logic being, that a significant variation in enforcement activity between two seemingly similar states must mean that there is discretion available to the implementing agencies within those states. While this conclusion is clearly the most intellectually satisfying, it is not the only possibility. It is equally possible, if not equally plausible, that a significant variation in enforcement activity between states is simply indicative of a significant variation in rate of incidence between the states. Meaning that it may be that the regulatory agencies in each state are

enforcing the same standards to the letter, but the coal operators in one state simply break the rules more often than the coal operators in the other state. In terms of the analysis presented in this chapter, I will stick with the assumption that variation is linked to discretion, but the legitimacy of this assumption will be discussed further in Chapter VI.

In terms of providing evidence of variation in enforcement activity in terms of SMCRA implementation, there are two dimensions of variation which will be of importance to us—intra-regional variation and inter-regional variation. Intra-regional variation is important in terms of our most similar systems analysis, because it provides evidence of variation on the dependent variable which is essential to most similar systems analysis. While it is important to capture variation on this dimension, the existence of variation between regions is also of theoretical importance.

In this section, I will seek to provide evidence of variation in enforcement activity by looking at variation between the two coal producing regions in the United States. Table 4.1 provides an analysis of the mean level of enforcement activities over the period of the study for each of the two coal producing regions.

Analysis of the results presented in Table 4.1 produce mixed results. In terms of the least stringent of the measures of enforcement activity, inspections per mine, the mean scores for each of the regions was shown to be statistically similar. This does not provide a very strong case for discretion in implementing agency action. This is also the case for the most severe of enforcement activities available to the state implementing

Table 4.1. Regional Variation in Enforcement Activities-Complete. This table examines regional variation in enforcement activity over the period of the study (1978-1997). For the data presented in this table, the eastern region includes the states of Alabama, Georgia, Illinois, Indiana, Kentucky, Maryland, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia. The states included in the western region are Alaska, Arkansas, California, Colorado, Iowa, Kansas, Louisiana, Missouri, Montana, New Mexico, North Dakota, Oklahoma, Texas, Washington, and Wyoming.

<u>Enforcement Activity</u>	<u>Mean</u>	<u>Standard Deviation</u>
Inspections per Mine		
Eastern Region	34.5173	31.302
Western Region	39.4265	0.178
	t= -1.258	P [t] = 0.209
Notices of Violation per Mine		
Eastern Region	3.0368	5.596
Western Region	2.0549	0.011
	t= 2.469	P [t] = 0.014
Notices of Violation per Inspection		
Eastern Region	0.0933	0.213
Western Region	0.0626	0.0002
	t= 2.207	P [t] = 0.028
Cessation Orders per Mine		
Eastern Region	0.3624	0.391
Western Region	0.4209	0.005
	t= -0.059	P [t] = 0.559

agencies, the issuance of cessation orders. However, the two measures for the middle measure of enforcement activity, notices of violation per mine and notices of violation per inspections, do yield significantly different results. Further, a cursory examination of the corresponding standard deviations for enforcement activities for each region produces an interesting result. We can clearly see in the Table 4.1 that the standard deviations for the measures of enforcement activity for the eastern region are much

larger than the corresponding standard deviations for the western region. As standard deviation is a common measure of dispersion of results around the mean, we can take this discrepancy to be indicative of much wider variation in enforcement activity among the states in the eastern region. With that being noted, what can we conclude regarding evidence of discretion in implementation of the SMCRA between regions? Well, certainly the evidence provided here suggests that some level of discretion is being exercised, if only in terms of notices of violation. For a more complete answer, I think that it is important to examine state-level variation in enforcement activity.

Table 4.2. Regional Variation in Enforcement Activities-Selected. This table examines regional variation in enforcement activity over the period of the study (1978-1997). For the data presented in this table, the eastern region includes Kentucky and Ohio, while the western region includes Montana and Wyoming.

<u>Enforcement Activity</u>	<u>Mean</u>	<u>Standard Deviation</u>
Inspections per Mine		
Eastern Region	26.6194	17.453
Western Region	18.2099	12.080
	t= 2.505	P [t] = 0.014
Notices of Violation per Mine		
Eastern Region	2.2554	1.862
Western Region	0.8834	0.776
	t= 4.299	P [t] = 0.000
Notices of Violation per Inspection		
Eastern Region	0.0690	0.0637
Western Region	0.0399	0.0350
	t= 2.456	P [t] = 0.018
Cessation Orders per Mine		
Eastern Region	0.3156	0.2889
Western Region	0.0847	0.1401
	t= 4.549	P [t] = 0.000

A second way to determine inter-regional variation is to measure variation between the two regions using only data from the states included in the analysis. While this may not necessarily give us a clearer picture of inter-regional variation, it should be useful in either confirming or disconfirming the evidence of inter-regional variation presented in the above model. Table 4.2 provides the results of this second measure of inter-regional variation.

An examination of the results presented in the above table show a significantly different level of enforcement for all available activities between the states represented in the model. While this should come as no real shock, since the cases to be included in the model were hand picked for inclusion, the results do suggest that at the very least, state-level discretion in enforcement activity is a possibility.

Now that the question of inter-regional variation in SMCRA enforcement has been addressed, the next topic of concern is intra-regional variation. As previously discussed, evidence of intra-regional variation in SMCRA enforcement activity is key to the method of analysis provided in this chapter. Since the particular comparative method design chosen to analyze variation in this chapter is the most similar systems design, the dependent variables presented in the model need to show significant variation. Since the conditions surrounding the production of coal and the nature of regulatory enforcement are suspected to be similar within each region, significant variation on the dependent variables should be attributable to significant variation on the variables of interest in the model. However, before that section of the analysis can begin, we must first establish the existence of intra-regional variation in enforcement

activity. The expectation is that we will see variation between the two states analyzed within each of the two regions. The results of the examination of the two states within the eastern region are presented in Table 4.3.

Table 4.3. Intra-Regional Variation in Enforcement Activities—Eastern Region. This table examines intra-regional variation in enforcement activity over the period of the study (1978-1997). For the data presented in this table, the eastern region includes the states of Kentucky and Ohio.

<u>Enforcement Activity</u>	<u>Mean</u>	<u>Standard Deviation</u>
Inspections per Mine		
Kentucky	25.39	14.119
Ohio	27.87	20.559
	t= 0.442	P [t] = 0.660
Notices of Violation per Mine		
Kentucky	1.4273	0.941
Ohio	3.0864	2.189
	t= 2.840	P [t] = 0.004
Notices of Violation per Inspection		
Kentucky	0.0514	0.021
Ohio	0.0956	0.083
	t= 2.527	P [t] = 0.017
Cessation Orders per Mine		
Kentucky	.225	0.182
Ohio	.408	0.347
	t= 2.079	P [t] = 0.044

An examination of the above table shows that in terms of the least severe of the enforcement activities available to state implementing agencies, number of inspections per mine, there is no significant variation among the states within the eastern region. While this finding certainly suggests that there may be little discretion available to

agents within state agencies on this activity, this finding is not all that surprising. As stated earlier in this dissertation, the number of inspections performed per mine is actually mandated by the OSM. Also, since inspections carry no punitive measure in and of themselves, it is unlikely that state agencies would choose to exercise much discretion in terms of their use. As for the other measures of enforcement activity available to state-level implementing agencies, there is evidence of significant difference between the states in the eastern region. In the subsequent sections of this chapter, we will see which of the variables of interest could influence this variation.

The second part of the analysis presented in this chapter was to complete a most similar systems analysis of a different region. In this case I have chosen to analyze the states of Montana and Wyoming from the western region. The results of the analysis of variation in enforcement activity for these states are presented in Table 4.4.

A review of Table 4.4 shows a significantly different level of enforcement activity on all available enforcement measures in the western region. As stated above, the logic behind the most similar systems comparative design would suggest that any significant variation on the variables of interest in the subsequent sections of this analysis can be seen as a potential influence on state-level enforcement activity.

So what can we say about the existence of state-level discretion in implementation of the SMCRA? Well, to the extent to which variation in enforcement activity is related to the amount of discretion available to the implementing agency—as suggested by the existing literature—there seems to be evidence of the use of discretion at the state-level.

Table 4.4. Intra-Regional Variation in Enforcement Activities—Western Region.

This table examines intra-regional variation in enforcement activity over the period of the study (1978-1997). For the data presented in this table, the western region includes the states of Montana and Wyoming.

<u>Enforcement Activity</u>	<u>Mean</u>	<u>Standard Deviation</u>
Inspections per Mine		
Montana	23.007	13.957
Wyoming	13.412	7.501
	t= 2.708	P [t] = 0.010
Notices of Violation per Mine		
Montana	1.325	0.864
Wyoming	0.441	0.280
	t= 2.892	P [t] = 0.007
Notices of Violation per Inspection		
Montana	0.052	0.042
Wyoming	0.027	0.013
	t= 4.348	P [t] = 0.000
Cessation Orders per Mine		
Montana	0.147	0.175
Wyoming	0.022	0.037
	t= 3.131	P [t] = 0.003

The Effect of Political Factors on Variation in Enforcement Activities

The third question of concern in this analysis deals with the effect of political factors on state-level implementation of the SMCRA. The question of the effect of political influence on regulatory program implementation is the subject of a veritable deluge of literature within the field of political science (Woods 2003; Carpenter 1996; McCubbins, Noll, and Weingast 1987; Moe 1985; 1982; McCubbins and Schwartz 1987;

Weingast and Moran 1983; Wood and Waterman 1994; Wood 1990; 1988; Moe 1985; Scholz et al 1991; Headrick 1990; Hedge, Menzel, and Williams 1988; Scholz and Wei 1986). However, the literature in the field is not as unified when it comes to how this political control is exercised over bureaucratic action. Much of the existing literature in the field deals with presidential and congressional influence over bureaucratic action through the various control mechanisms that these powers have at their discretion. While other literature in the field (particularly the work of Scholz and his various co-authors) looks at the effect of local political influences on bureaucratic action, especially when the regulatory policy in question is implemented at the sub-national level like the SMCRA.

In terms of this analysis, I have outlined a plan to account for political influence based upon the traditional partisanship hypothesis which attributes variation in political control to variation in ideology among the parties. The first variable of relevance to the partisanship hypothesis concerns a measure of state government ideology provided by Berry et al (1998). The basic hypothesis being that the more liberal the ideology of the state government, the greater the enforcement activity of the state implementing agency. The results of the analysis of the effect of state government ideology on variation in implementation in both the eastern and western regions are presented in Table 4.5.

An examination of the Table 4.5 shows that in terms of the two states in the eastern region, there is a statistically significant difference in terms of state government ideology. In the eastern region, we see that Kentucky has a significantly higher score on

the Berry et al index of state government ideology than does Ohio. In terms of enforcement activity, what does this tell us? Theoretically, based solely on the

Table 4.5. Intra-Regional Variation in the Effect of Political Factors on Enforcement Activities. This table examines intra-regional variation in the effect of state government ideology on enforcement activity over the period of the study (1978-1997). For the data presented in this table, the eastern region includes the states of Ohio and Kentucky, and the western region includes the states of Montana and Wyoming.

<u>Variable</u>	<u>Mean</u>	<u>Standard Deviation</u>
State Government Ideology		
Kentucky	67.322	9.009
Ohio	46.872	23.409
	t= 3.646	P [t] = 0.000
State Government Ideology		
Montana	44.736	23.115
Wyoming	34.948	13.189
	t= 1.645	P [t] = 0.108

partisanship hypothesis, that Kentucky would exhibit a significantly higher level of enforcement activity. However, a review of Table 4.3 shows that of the available enforcement activities that demonstrate a significant difference between the states, that Kentucky has a lower rate of enforcement on all three measures—notices of violation per mine, notices of violation per inspection, and cessation orders. This is the exact opposite of what we would expect.

An examination of Table 4.5 for the western states shows that while Montana does score higher than Wyoming on the state government ideology index, that the difference is statistically insignificant. That means that in terms of our most similar

systems analysis, that we would not expect state government ideology to be a causal factor in the differences between the states in enforcement activity.

The second measure of political influence in terms of explaining variation in state-level enforcement activity is the presidential dummy variable. In terms of the comparative method analysis presented in this chapter, the influence of presidential party would not be expected to be of any relevance in determining intra-regional variation. The simple reason for this is that there is no variation among the states on this variable, this variable instead captures variation over time. As such, the best method for analyzing the influence of presidential administration on variation in enforcement would be the pooled time series analysis presented in Chapter V.

So what does this tell us concerning the impact of political factors on state-level variation in implementation of the SMCRA? Well, certainly the analysis presented here does not paint a pretty picture concerning the impact of political variables. In only one case did we see significant variation, and in that case, the impact was in the opposite direction of what we would theoretically expect. An analysis of the other variables of interest may shed some light on these findings.

The Effect of Economic and Market Forces on Enforcement Activities

The fourth question of relevance in this study deals with the impact of economic and market forces on implementation of federal regulatory programs. In terms of economic impact, the variable of interest presented in this model is the average mine-mouth coal price. The hypothesis being that the higher the average mine-mouth coal

price, the healthier the coal industry. In terms of economic theories of regulation presented in Meier (1985), the healthier the industry, the more likely that it will be stringently regulated, as it would be better able to absorb the negative economic impact of regulation. With this being noted, we would expect states with a higher mine-mouth coal price to exhibit higher levels of enforcement activity. Results of the analysis concerning this variable are available in Table 4.6.

Table 4.6. Intra-Regional Variation in Effect of Economic and Market Forces.

This table examines intra-regional variation in average mine-mouth coal price and productivity over the period of the study (1978-1997). For the data presented in this table, the eastern region includes the states of Kentucky and Ohio. The western region includes the states of Montana and Wyoming.

<u>Variable</u>	<u>Mean</u>	<u>Standard Deviation</u>
Average Mine Price		
Kentucky	15.150	4.626
Ohio	16.895	4.453
	t= 1.215	P [t] = 0.232
Average Mine Price		
Montana	6.514	1.931
Wyoming	5.681	2.383
	t= 1.214	P [t] = 0.232
Productivity		
Kentucky	2.759	0.644
Ohio	2.633	0.708
	t= 0.585	P [t] = 0.562
Productivity		
Montana	17.312	3.801
Wyoming	19.260	8.124
	t= 0.971	P [t] = 0.338

An examination of the above table shows that there is no significant variation in either region based upon the average mine-mouth coal price. Therefore, in terms of our most similar systems analysis we would not expect average mine-mouth coal price to be a causal factor in determining intra-regional variation in enforcement activity.

The second variable which seeks to answer the question concerning the effect of economic and market forces on variation in enforcement activity is the productivity variable. The hypothesis concerning the link between productivity and enforcement deals with the relationship between productivity and profitability. The basic assertion being that a more productive industry is a more profitable industry. The link between profitability and regulation is defined by Meier (1985) in the following way. The more profitable an industry, the healthier that industry is, and the more capable it would be of enduring stringent regulation. Therefore, we would expect that those states which exhibit high levels of productivity would be more likely to have high levels of enforcement activity.

A review of the results presented in Table 4.6 show that, much like the measure of average mine-mouth coal price, there is no significant intra-regional variation present. In terms of our most similar systems analysis, this is no real shock. These variables, more than anything else, demonstrate the difference between the regions in terms of type of coal mined and method of extraction, which were two of the key reasons for dividing the states into the two separate regions in the first place. Therefore the real impact of these variables should be expected to be inter-regional, or due to changes over time. Since neither of these dimensions are captured by the most similar systems analysis, the

fact that there is no significant variation is expected. A review of Table 4.2 shows that there is significant variation in enforcement activity between the regions, but again, this is no surprise as the majority of characteristics concerning coal production between the regions is different. Therefore, the best method of determining whether or not economic and market forces influence variation in state-level implementation of the SMCRA will be through the pooled time series analysis presented in Chapter V.

The Effect of Competition within the Policy Arena on Enforcement Activities

The fifth question of relevance in terms of this analysis concerns the effect of competition among the effected interests on state-level variation in implementation. In terms of the effect of competition, we have chosen two variables for inclusion in the model which show the relative strength of each of the competing interests within the policy arena, the coal industry and the environmental lobby. The first variable of interest in terms of competition is a measure of the relative strength of the coal industry—percent state GSP attributable to the coal industry. This variable should provide a good baseline of strength of the coal industry in the respective states because it measures the economic dependence of each state on the coal industry. The hypothesis being that those states which are more dependent upon the coal industry for their economic well-being are going to be less likely to stringently enforce the SMCRA.

The second variable of interest in terms of the competition hypothesis is the League of Conservation Voters score for the congressional district representing the respective states. The League of Conservation Voters is a pro-environmental interest

group which produces an annual scorecard representing the proportion of the time that members of congress vote in favor of the pro-environmental stance on bills of interest. From this score presented for the individual members of congress, we can then create an aggregate measure which represents the pro-environment score for the entire state. This variable should be of use in determining the relative power position of the environmental lobby within the respective states because it provides a measure which is directly linked to policy outcomes. The general hypothesis being that the higher the score on the LCV variable, the greater the enforcement activity exhibited by the regulating agency within said state.

An analysis of the Table 4.7 reveals some interesting results concerning competition between competing interests within the states. In the eastern region Kentucky has a significantly higher score than Ohio on the “percent state GSP attributable to coal” variable, while Ohio has a significantly higher score on the “LCV score” variable. This means that the ideal situation in terms of our most similar systems analysis exists on the variables concerning the effect of competition in the eastern region. In this case, we would expect the state of Ohio to exhibit a higher level of enforcement activity on all available measures. A review of Table 4.3 shows that, as expected, the state of Ohio does exhibit a significantly higher level of enforcement on the measures of notices of violation per mine, notices of violation per inspection, and cessation orders per mine, while there is no significant difference in terms of inspections per mine. This finding is precisely what theory would lead us to expect.

Table 4.7. Intra-Regional Variation in Effect of Competition within the Policy Arena. This table examines intra-regional variation in the percentage of state GSP attributable to the coal industry and League of Conservation Voter scores over the period of the study (1978-1997). For the data presented in this table, the eastern region includes the states of Kentucky and Ohio. The western region includes the states of Montana and Wyoming.

<u>Variable</u>	<u>Mean</u>	<u>Standard Deviation</u>
Percent State GSP-Coal		
Kentucky	4.267	1.897
Ohio	0.317	0.156
	t= 9.281	P [t] = 0.000
Percent State GSP-Coal		
Montana	2.243	0.848
Wyoming	6.954	0.821
	t= 17.848	P [t] = 0.000
LCV Score		
Kentucky	32.030	8.668
Ohio	47.534	7.916
	t= 5.907	P [t] = 0.000
LCV Score		
Montana	46.200	16.740
Wyoming	8.350	9.658
	t= 8.758	P [t] = 0.000

The results of the analysis of the western states mirror those of the eastern states.

In Table 4.7 we see that Wyoming scores significantly higher than Montana on the percent of state GSP attributable to coal variable, while Montana scores significantly higher on the LCV score variable. A review of level of enforcement activity presented in Table 4.4 shows that Montana—the pro-environmental state—scores significantly

higher on all available measures of enforcement activity than does Wyoming—the pro-industry state.

These results could not be better in terms of the theoretical expectations regarding the effect of competition within the policy arena on state-level variation in implementation. In this case, the states within each region fall neatly into two groups, the pro-environment states—Ohio and Montana—and the pro-industry states—Kentucky and Wyoming. What does this suggest in terms of the effect of competition on enforcement activity? Well certainly, going into the pooled times series analysis, we have a good reason to expect the competition variables to have a significant impact.

Statistical Control

The last variable presented in Chapter III as being potentially relevant in terms of explaining state-level variation in implementation of the SMCRA is the variable related to method of extraction. The particular variable is the percent of a states total coal production that is attributable to surface mining. The logic behind the inclusion of this variable is that since the SMCRA seeks to regulate the surface mining of coal, and not particularly the effects of underground coal production, that those states with a significant percentage of production attributable to underground mining might differ in terms of enforcement activity. In terms of the most similar systems analysis presented in this chapter, this dimension correlates significantly with many of the reasons why we chose to divide the states into two regions in the first place. Therefore, there is no reason to expect significant intra-regional variation. However, an examination of the percent

surface mine variable did show a significant variation in the eastern region. The results of that analysis are presented in Table 4.8.

Table 4.8. Intra-Regional Variation in the Method of Extraction. This table examines intra-regional variation in the percentage of a states total coal production attributable to surface mining on enforcement activity in the eastern region over the period of the study (1978-1997). For the data presented in this table, the eastern region includes the states of Ohio and Kentucky.

<u>Variable</u>	<u>Mean</u>	<u>Standard Deviation</u>
Percent Surface Mines		
Kentucky	44.519	5.396
Ohio	61.918	7.425
	t= 8.476	P [t] = 0.000

What does this variation in method of extraction mean for the eastern region?

Well, Ohio produces a higher percentage of it coal through surface mining than does Kentucky, and also exhibits a higher level of enforcement activity on all available measures. So, in terms of the eastern region, perhaps method of extraction does cause variation in levels of enforcement. We should be interested to see if this trend continues in the pooled time series analysis presented in Chapter V. In terms of the western region, a review of the percent surface mine variable show that each state produced between 98.7 and 100 percent of their coal through surface mining over the time period of the study. Clearly, there is no difference between the western states in terms of method of extraction.

So what has the most similar systems analysis presented in this chapter shown?

In terms of the first two questions of relevance to this study—the questions of whether the state-level implementing agency has some discretion in terms of enforcement

activity—I think that the answer is certainly yes. The three other questions of relevance produce more of a mixed bag of results. In terms of the effects of political factors in terms of SMCRA implementation, I would have to say that the analysis provides no clear answer in terms of influence. In one region, the measure was insignificant, and in the region where the measure was significant, the effect was in the opposite direction of what is theoretically expected. In terms of the effect of economic and market forces on implementation, the nature of the most similar systems study does not allow for much in terms of analysis, as these variables are indicative of the regional variation which is controlled for by the model. The most promising results of this analysis are the ones related to the effect of competition within the policy arena on variation in implementation. Analysis of the states in both regions produced significant results in the direction which was theoretically expected. Clearly, all of the questions concerning state-level variation in implementation of the SMCRA have not been answered in this analysis, so the pooled time series analysis presented in Chapter V should help to clear things up a bit.

CHAPTER V

POOLED TIME SERIES ANALYSIS OF SMCRA ENFORCEMENT

In Chapter IV of this dissertation, I conducted a comparative method case study analysis of SMCRA enforcement in four states. This analysis examined the five questions of relevance in studying state-level variation in enforcement of federal regulatory programs discussed in Chapters I and II. The results of the analysis indicated that the first two questions of relevance in the model were answered fairly convincingly. There does appear to be evidence of discretion being present in terms of enforcement activity, and this variation seems to be susceptible to state-level factors. Beyond that, Chapter IV looked at the likelihood that this variation could be explained by looking at the impact of economic and political factors, along with interest group competition within the policy arena. In Chapter V of this dissertation, I subject these assertions to a much more rigorous analysis through the use of pooled time series statistical techniques. In the research design chapter of this dissertation, I claimed that I would employ a pooled time series statistical technique as the second stage of analysis, which is roughly the equivalent of saying that I will be rooting for a National League team in the upcoming baseball season. In order to correct this lack of precision in revealing the specifics of my plan, this chapter begins with a discussion of the precise technique being employed. I continue by presenting the findings of the examination of each of the four dependent variables discussed in Chapters III and IV using the technique described over the next couple of pages.

Method

Modeling using pooled time series techniques is susceptible to the problems of both autocorrelation and heteroskedasticity, and is not an exact science. Therefore, as much care as possible must be taken to ensure the efficiency of the estimators created by using such techniques. More specifically, modeling dynamic pooled time series, or panel data typically present substantial problems in meeting the requirement that the explanatory variables in the model be uncorrelated with the disturbance term (Wawro 2000). Unfortunately, most of the existing literature on the subject lends little assistance in terms of a straightforward approach to dealing with such data (Wawro 2000; Greene 2000; Beck and Katz 1995; Baltagi 1995; Hsiao 1986). So which pooled time series technique is appropriate for this analysis? There are several ways to go.

The first problem that needs to be addressed is accounting for unit specific variation. The first and most simple approach to modeling dynamic panels is to simply introduce fixed effects; however, this approach has several flaws. First, this technique dramatically reduces the degrees of freedom in the model by introducing $[n+t]$ parameters to the model. While this effect can be replicated by centering the data, the concept still neglects to address the dynamic nature of the data (Meier et al 2001).

The second problem which needs to be addressed deals with autocorrelation. When modeling agency data over time, theory would dictate that the organizations should have some sort of inertia in the production function. That is, each year production should be effected by the previous year. This effect is typically controlled by using one of two popular techniques. The first is the use of a lagged dependent variable,

and the second is by actually estimating the correlation with the model using a GLS estimator. While both techniques have merit, the latter allows for the application of a panel specific correlation coefficient to be calculated as well as avoiding the problems inherent in the use of a lagged dependent variable.

Calculating the panel specific correlation does reduce the available degrees of freedom in the model by $t-1$, however this prevents generating correlation between the regressors and the error within the model. After calculating the panel specific correlation coefficients, this specification can be tested against a common correlation coefficient model using a simple likelihood ratio test¹⁶.

The models presented in this dissertation are estimated using Prais-Winsten regression. Beck and Katz (1995) note that this approach is superior to a Feasible Generalized Least Squares (FGLS) approach, as FGLS variance-covariance has been shown to be less conservative with these types of data. The likelihood ratio test for the panel specific correlation coefficient indicates that panel specific AR estimates are not necessary in these models; however, this does not exclude the possibility of contemporaneously correlated or heteroskedastic panels. To protect these models from bias introduced by these pathologies, I evaluate parameter significance using panel-corrected standard errors (Beck and Katz 1995).

Now that the specifics of the pooled time series technique employed in this dissertation have been discussed, I will present the findings of the analysis of each of the

¹⁶ The likelihood ratio test is modeled as $\lambda_{LR} = -2(\ln|\Sigma_i| - \ln|\Sigma|)$. This is tested as a chi-squared statistic with d.f.=n-1.

four dependent variables. The variables, which represent the enforcement activities employed by the regulating agencies, will be discussed in increasing order of severity.

Enforcement Activities

The first enforcement activity examined by pooled time series analysis is the one that is considered to be the least punitive in nature. Scicchitano et al (1989) note that the first of “several key tasks that state inspectors must perform to enforce the SMCRA properly” is to conduct the inspection itself. As discussed in Chapter III, the number of inspections to be performed is mandated by the federal regulating agency, and has varied over the time of this study from a low of two per mine per year, to a high of twelve. In the time period of the Scicchitano et al study, the number of inspections per mine per year was set at four. Theoretically, if all of these inspections were performed as mandated, the usefulness of this variable in terms of explaining state-level variation would be nil. As is, this variable’s usefulness is considered to be somewhat less than the other, more serious enforcement activities available to the implementing agency. However, as Scicchitano et al point out, the importance of this variable lies in the fact that it is the first step in the enforcement process. The results of the model concerning inspections per mine are presented in Table 5.1.

Table 5.1—The Effect of the Variables of Interest on Inspections Completed Per Mine.

Variable	Coefficient (Standard Error)	Z	P> z
Intercept	75.249 (24.647)	3.05	0.002
State Government Ideology	0.022 (0.160)	0.14	0.888
Presidential Party ID	11.194 (6.282)	1.78	0.075
Average Mine Price	-1.707 (1.040)	-1.64	0.101
Productivity	0.728 (1.047)	0.69	0.487
% State GSP Coal	-3.149 (1.162)	-2.71	0.007
LCV Score	0.094 (0.155)	0.60	0.545
Percent Surface Mines	-0.347 (0.217)	-1.60	0.110
N=296			
R-squared=0.010			
Rho=.7008			

As we move to the second level of enforcement activity available to the state implementing agencies, there are two separate measures which have been used in the existing literature. The reason for including two separate measures of Notices of Violation is that it is often seen as being the most important enforcement measure for identifying variation in implementation. The reason for this is quite simple really. The first measure, inspections are simply not severe enough in and of themselves to draw the discretion of the regulatory agency. The last enforcement activity to be examined, the issuance of a cessation order, is so severe that they is in fact a quite rare occurrence. That means that the middle measure, NOV's is just right. Severe enough to have some

impact, but not so severe as to truly impede productive capability. Scicchitano et al (1989) describe notices of violation as a written notice issued to the operator, giving them 90 days to develop and implement a plan to correct any violations found during a routine inspection. In addition to this ultimatum, the inspector can also levy fines for notices of violation. The amount and severity of the fines is left up to the discretion of the inspector.

The first measure to be used to measure the effect of the variables of interest on the number of NOV's issued is the number of notices of violation per mine. Results for the model concerning notices of violation per mine are presented in Table 5.2.

Table 5.2.—The Effect of the Variables of Interest on Notices of Violation Issued Per Mine.

Variable	Coefficient (Standard Error)	Z	P> z
Intercept	11.075 (3.440)	3.22	0.001
State Government Ideology	0.004 (0.013)	0.28	0.782
Presidential Party ID	-0.443 (0.632)	-0.70	0.484
Average Mine Price	-0.143 (0.084)	-1.70	0.090
Productivity	-0.056 (0.051)	-1.10	0.269
% State GSP Coal	-0.305 (0.153)	-1.99	0.046
LCV Score	-0.029 (0.015)	-1.95	0.051
Percent Surface Mines	-0.066 (0.028)	-2.36	0.018
N=296			
R-squared=0.039			
Rho=.7416			

Much of the existing literature on variation of state-level implementation of the SMCRA uses this measure. In addition to the fact that this is the most common measure, it is also the measure which utilizes the mechanism of control found in the two other enforcement activities, inspections and cessation orders. However, there is a theoretical reason to believe that the number of inspections performed will have some effect on the number of notices of violation issued. As such, I think that it is necessary to address this possibility in the model. One way to account for this influence is to run

Table 5.3.—The Effect of the Variables of Interest on Notices of Violation Issued Per Mine, Including the Effect of Inspections Per Mine.

Variable	Coefficient (Standard Error)	Z	P> z
Intercept	2.566 (1.356)	1.89	0.058
State Government Index	0.013 (0.008)	1.62	0.105
Presidential Party ID	-0.282 (0.367)	-0.77	0.443
Average Mine Price	0.012 (0.042)	0.28	0.779
Productivity	-0.057 (0.041)	-1.40	0.162
% State GSP Coal	-0.146 (0.069)	-2.12	0.034
LCV Score	-0.007 (0.008)	-0.81	0.420
Percent Surface Mines	-0.014 (0.012)	-1.18	0.237
Inspections Per Mine	0.022 (0.005)	4.65	0.000
N=296			
R-squared=0.127			
Rho=.6091			

the data as a “nested model” of enforcement. Since we have reason to believe that inspections per mine might influence the number of notices of violation issued per mine, this variable should be included in the model not as dependent variable, but as an independent variable. The results of this analysis are presented in Table 5.3. We see that in this model, the number of inspections per mine are clearly related to the number of notices of violation issued per min, as we would expect. However, the significance and direction of the other variables of interest does not change.

Table 5.4—The Effect of the Variables of Interest on Notices of Violation Issued Per Inspection.

Variable	Coefficient (Standard Error)	Z	P> z
Intercept	0.031 (0.069)	0.45	0.650
State Government Ideology	0.000 (0.001)	0.14	0.888
Presidential Party ID	-0.038 (0.041)	-0.92	0.355
Average Mine Price	0.009 (0.003)	2.93	0.003
Productivity	0.003 (0.004)	0.80	0.424
% State GSP Coal	-0.008 (0.006)	-1.44	0.149
LCV Score	0.000 (0.000)	0.22	0.827
Percent Surface Mines	-0.001 (0.001)	-0.67	0.503

N=257

R-squared=0.052

Rho=.4503

The second measure to be examined is the number of notices of violation issued per inspection. This is the measure used by Neal Woods (2003) in his dissertation. The reason for using this measure for notices of violation is that since every violation observed during an inspection should be cited, a similar number of inspections should lead to a similar number of notices of violation. The results for the model concerning notices of violation per inspection is presented in Table 5.4.

The final enforcement activity used under the SMCRA is the cessation order. Cessation orders are by far the most severe and punitive of the enforcement mechanisms.

Table 5.5—The Effect of the Variables of Interest on Cessation Orders Issued Per Mine.

Variable	Coefficient (Standard Error)	Z	P> z
Intercept	10.116 (4.679)	2.16	0.031
State Government Index	-0.019 (0.017)	-1.07	0.283
Presidential Party ID	-0.218 (0.896)	-0.25	0.802
Average Mine Price	-0.143 (0.098)	-1.45	0.147
Productivity	-0.040 (0.045)	-0.89	0.371
% State GSP Coal	-0.178 (0.188)	-0.95	0.342
LCV Score	-0.048 (0.021)	-2.29	0.022
Percent Surface Mines	-0.057 (0.037)	-1.52	0.129
N=296			
R=squared=0.034			
Rho=.7141			

A cessation order is issued by the inspector if the notice of violation is not heeded.

When a cessation order is issued, mining operations are halted until the violation has been corrected. In addition to the halt in production associated with the cessation order, fines and penalties are also levied. Due to the punitive nature of the cessation order, we will find them to be much rarer occurrences than either inspections or notices of violation, and as such we might expect the variation to be minimalized. Results for the model concerning cessation orders per mine are presented in Table 5.5.

In the case of cessation orders issued per mine, theoretically we have reason to expect that the number of inspections per mine and the number of notices of violation issued per mine might effect this most punitive of enforcement measures. As such, it is prudent to run the data using a nested model to account for this possible influence. The results of this analysis are presented in Table 5.6.

In this model, we see some changes in the direction of the coefficients, and we also lose some significance in terms of the LCV Score variable and gain significance in terms of the percent surface mine variable. As expected, the variables for the enforcement activities which lead to cessation orders are also significant. While this model clearly shows that lower-level enforcement activities affect higher-level enforcement activities, the interpretation of the model concerning the impact of the political, economic, and competitive forces on implementation remains largely unchanged.

Table 5.6—The Effect of the Variables of Interest on Cessation Orders Issued Per Mine, Including the Effect of Inspections Per Mine and Notices of Violation Per Mine.

Variable	Coefficient (Standard Error)	Z	P> z
Intercept	-0.409 (0.225)	-1.82	0.069
State Government Index	-0.001 (0.001)	-0.31	0.753
Presidential Party ID	0.004 (0.058)	0.08	0.937
Average Mine Price	0.015 (0.008)	1.82	0.067
Productivity	-0.013 (0.009)	-1.40	0.162
% State GSP Coal	0.001 (0.008)	0.13	0.895
LCV Score	-0.002 (0.001)	-1.20	0.231
Percent Surface Mines	0.005 (0.002)	2.49	0.013
Inspections Per Mine	0.001 (0.001)	2.84	0.004
Notices of Violation Per Mine	0.091 (0.019)	4.93	0.000
N=293			
R-squared=0.268			
Rho=.5979			

The purpose of the pooled time series examination of the dependent variables is to establish the correlation between variation in enforcement activity of the state-level implementing agency, and indicators of economic, political, and interest group competition factors within the respective states. As such, I will present the relevant findings associated with each of the respective questions. The first question of relevance to this section of the analysis deals with the effect of political factors.

Political Factors Affecting Implementation

As discussed at the beginning of this chapter, the question as to whether or not there is evidence of discretion being utilized in the implementation of the SMCRA has been answered, at least anecdotally in Chapter IV of this dissertation and in the existing literature. Therefore, in the statistical analysis section of the dissertation, I will consider these questions to be sufficiently answered, and will instead turn my attention toward answering the remaining three questions of concern in this analysis.

Therefore, the third question of relevance in terms of this study, the question as to what effect political forces have on implementation of the SMCRA will be considered here. In Chapter III, I outlined a series of hypotheses to test this effect in the analytical portion of this dissertation. The first hypothesis makes a statement about the relationship between state government ideology as determined by the Berry et al index and the measures of enforcement. Since the Berry et al index is coded as a zero for the most conservative and one hundred for the most liberal, the expectation is that those states with a higher score on the index would exhibit a higher level of enforcement.

A review of the data presented in the preceding tables shows that the coefficient for the state government index variable in terms of inspections per mine is insignificant. Likewise, the two models examining the effect of the variables of interest on the number of notices of violation issued produced insignificant results. The results of the analysis of the number of cessation orders issued per mine continues to suggest that there is no correlation between state government ideology and variation in state level implementation of the SMCRA. In this case not only is the coefficient insignificant, but

it is not even in the expected direction. So what does that tell us about the effect of state government ideology on the number of inspections per mine in that respective state?

The answer seems to be that variation in the state government ideology for a state has no significant impact on the level of enforcement activity carried out by the state implementing agency.

The second hypothesis in Chapter III which made a statement concerning the partisanship hypothesis was the presidential dummy variable. In the first model (inspections per mine), the presidential dummy variable is significant at the .10 level, but insignificant at the .05 level. In my first statistics class in graduate school, I once heard that when it comes to statistical analysis, that .05 as a measure of statistical significance isn't written in stone, but that it is pretty close to being written in stone. If we ignore this rule and assume that the variable is significant, then how should it be interpreted? As noted in Chapter III, the presidential party ID dummy variable is coded as a zero for Democratic presidents and a one for Republican presidents. Since the coefficient is positive, that would mean that a higher rate of inspection is associated with Republican administrations. This is the opposite of what would be expected, so the slight significance of this variable should be taken with a grain of salt. As for the other enforcement mechanisms studied in the analysis—notices of violation, both per inspection and per mine, along with cessation orders per mine—all show no significant relationship between presidential party identification and variation in enforcement activity.

With this being noted, what do the partisanship hypotheses tell us about our relationship? In terms of all measures of enforcement activity—inspections, notices of violation, and cessation orders—we should discount the impact of political influences on variation in state-level implementation.

Economic and Market Forces Affecting Implementation

The fourth question of relevance to the study of state-level variation in the implementation of the SMCRA deals with the impact of economic and market forces on enforcement activity. In Chapter III, two hypotheses were constructed to examine what effect, if any economic and market forces have on implementing agency enforcement activity. The first hypothesis concerning the impact of economic and market forces deals with the average mine price per short ton of coal mined in the respective states. The results of the statistical analysis presented in the preceding tables shows that average mine price variable is insignificant as a possible determinant of number of inspections performed per mine.

Interpretation of the models examining notices of violation is not as straightforward. The model which used the variable controlled by the number of mines—presented in Table 5.2—produced a somewhat large (.143), negative, slightly (.09) significant coefficient. Whereas the model which used the variable controlled by the number of inspections—presented in Table 5.4—produced a small (.03), positive, coefficient significant at the .05 level. So what does this mean for the effect of average mine price on the use of notices of violation as an enforcement activity? Well, there are

two ways to answer that question. One way is to simply cut off the level of significance at .05 and to declare that in the second model, a significant positive relationship was found. A significant positive relationship would mean that a higher average mine price, indicative of a stronger industry, would produce a slightly higher rate of enforcement activity. The second, and more conservative way to interpret the finding, is to suggest that due to the small coefficient in the second model, and in part due to the pitifully low r-square (.052) produced by the model, that it would be imprudent to attribute too high a significance to the correlation. Due to my conservative nature, I think that the latter interpretation is more appropriate.

As for the final measure of enforcement activity, cessation orders, a review of Table 5.5 shows a negative and insignificant relationship. So what can we say of our measure of economic forces? A liberal interpretation would suggest a weak, but significant effect in terms of NOVs, but a more conservative interpretation finds no evidence of economic forces having an impact on state-level variation in implementation of the SMCRA.

The second hypothesis in this section deals more specifically with the effect of market forces on SMCRA implementation. The corresponding variable is the level of productivity exhibited by the coal industry within said state. The hypothesized relationship is that the greater the productivity of the industry, the greater the profitability of that industry. A basic economic theory of regulation posits that the stronger the industry the more stringent regulation of that industry is likely to be (Meier 1985). In this case, the higher the productivity, the more likely that regulation is going

to be stringent, so we would expect the coefficient to be positive. In the case of the number of inspections per mine, the coefficient is positive, but not significant. A look at the variables effect on the two measures of notices of violation, as well as cessation orders produces a mix of positive and negative insignificant coefficients.

Since both variables reflecting the effect of economic and market forces are insignificant in this model, we must conclude that there is no evidence to support the notion that economic and market forces have a substantial effect on state-level variation in the implementation of the SMCRA.

The Effect of Competition Among the Competing Interests on Implementation

The last question of relevance to this dissertation deals with the effect of competition within the policy arena on SMCRA implementation. The affected interest competition hypotheses are based upon the theory that policy implementation is affected by the level, and quality of participation present within the policy arena. The basic theory posits that in situations where one group has an advantage over another within the basic policy arena, implementation will benefit the favored group. The assumption concerning most environmental policies had been that the regulated industry would almost always be advantaged based upon that fact that the costs levied on the industry were concentrated, and that the benefits received by the public at large were diffuse (Wilson 1980). However, in the last ten or so years, studies of environmental policies have found a surprising amount of public support for environmental protection initiatives (Vig and Kraft 2003, Guber 2003, Kempton et al 1995, Ladd and Bowman 1995,

Ringquist 1993b, Dunlap 1991). This being noted, the concept of competition and its affect on implementation of regulatory programs becomes relevant. In this specific case, the competing interests in the model are the coal industry on the one hand, and the environmental movement on the other. In Chapter III, I outlined two variables which should provide some measure of the power positions of these affected groups.

The first variable which is of importance in this respect is a measure of the regulated industries strength. The basis for the inclusion of this variable is that it measures the power position of the regulated industry by examining the importance of that industry in terms of the respective state's economic well-being. The specific measure that was chosen was the proportion of the state's GSP which was attributable to the industry in question, in this case the coal industry. A review of the results of the statistical analysis presented in Table 5.1 shows that this variable is significant, even at the .05 level of probability, but is negative (-3.149). Interpretation of this coefficient would suggest that the more dependent a state is on coal as a resource, the higher the level of inspections per mine. While this finding suggests a relationship in the opposite direction of what might normally be expected, one possible explanation surrounds the nature of the enforcement activity itself.

As stated at the beginning of this section, inspections are the least severe enforcement activity available to the implementing agency, and as such, carry little or no punitive measure. In a state where coal is a valuable resource, it would be much better for the implementing agency to keep up a high level of inspections so as to not call attention to the fact that their use of more severe enforcement procedures is lax. A look

at the impact of this variable on the more stringent enforcement activities should help to answer this question. The coefficients representing the effect of the percentage of state GSP attributable to coal as a resource are negative in each of the remaining models, but only significant in the notices of violation per mine model (-0.305) presented in Table 5.2. This suggests that the negative relationship present in the more severe enforcement activity is probably not due to some strategic use of discretion in enforcement activity as was previously suggested in the interpretation of the number of inspections per mine variable presented in Table 5.1. Ideas concerning the cause of this seemingly opposite relationship will be discussed further in Chapter VI.

The second measure of interest group strength examined in the model is a measure of the strength of the representative environmental movement with the respective state. In Chapter III, the variable in question was identified as the League of Conservation Voter score for the corresponding state's congressional delegation. The idea being that true interest group strength is translated into tangible voting practices. Therefore states with a higher score on the LCV scorecard should be more environmentally friendly, and thereby produce more stringent enforcement activity. A review of the analysis presented in Table 5.1 shows that the coefficient for the LCV score is positive, but insignificant in terms of inspections per mine. Examination of the other three models shows a significant and negative relationship for notices of violation per mine (-0.029) and cessation orders (-0.048)¹⁷, but an insignificant positive relationship for notices of violation per inspection.

¹⁷ Notices of violation per mine presented in Table 5.2. Cessation orders presented in Table 5.5.

Again, this relationship is the opposite of what would be expected theoretically. Interpretation of these results suggests that the more powerful the environmental movement within a state, the lower the level of enforcement activity exhibited by the implementing agency within that state. However, as has been noted in this chapter already, the low r-square produced by all of these models suggests that they are capturing very little of the variation. As a result, these indicators seem to suggest that the relative position strengths of the competing interests have little or no effect on variation in state level implementation of the SMCRA.

Statistical Control

The last variable to be evaluated in this section of the dissertation is the percent of total production within the state attributable to surface mining. As discussed in Chapter III, the inclusion of this variable in the model was done as a means of providing some statistical control to capture variation attributable to the method of extraction. The two major coal producing regions in the United States differ greatly in method of extraction. Most of the coal mined in the eastern region is extracted through a fairly even mix of both surface and underground mining, whereas a much higher percentage of the coal mined in the western region comes solely from surface mining.

The inclusion of this variable is relevant for a couple of reasons. First, since the SMCRA deals with the regulation of surface mining, it is reasonable to expect that variation in the amount of coal produced by that particular method of extraction might affect enforcement activity. The direction of that effect is not as straightforward an

interpretation. One might suggest that since there is more of the regulated activity occurring in states with a high percentage of surface mining as a means of extraction, that enforcement activities should be expected to be greater. The other side to that coin, is that states which produce a large amount of coal through the method of underground extraction might be more willing to stringently regulate the less important method of surface mining.

A review of the results of the preceding tables show that in terms of numbers of inspections conducted per mine, the method of extraction does not have a significant impact. The evidence for notices of violation again produces a mixed result. In the measure of notices of violation per mine¹⁸, the coefficient is negative and significant (-0.066). Interpretation of this result would suggest that the greater the percentage of surface mines in a state, the less stringent the enforcement activity. At first glance this would seem to suggest that there may be some evidence of industry protection taking place in states which extract coal mainly through surface mining. However, as discussed in Chapter IV, the majority of states which rank high on this variable, are western states where there are significantly fewer mines, and where enforcement is probably easier. Therefore, this significant result could be due to that artifact rather than to discretion being exerted by the implementing agency. The second measure seems to back up this assertion by virtue of the fact that in the second model, using the measure of notices of violation per inspection, the result is insignificant. Likewise, the method of extraction variable has an insignificant effect on the number of cessation orders issued per mine.

¹⁸ Presented in Table 5.2

So what lessons can we take from the pooled time series analysis section of this dissertation? Well certainly, the relationships demonstrated in the comparative method case study section of the analysis seemed to be greatly diminished, if they do not disappear altogether. A discussion of these results and some speculation as to the possible causes will be discussed in Chapter VI.

CHAPTER VI

CONCLUSIONS

In the first five chapters of this dissertation, I have outlined and completed a study which sought to examine five questions of concern in state-level implementation of the Surface Mining Control and Reclamation Act. These questions sought to examine the extent to which variation in implementation of the SMCRA existed, and if variation did exist, the extent to which a group of political and economic factors influenced that variation. In terms of the results of the analysis, I must admit a bit of a mixed bag of results. In an effort to examine the results in a parsimonious fashion, I will address each of the five questions which were the focus of this dissertation individually. In addition to the results of this analysis in terms of each of the five questions, I will discuss how these findings fit into the existing literature in the field, and the implications for future research given the reported findings.

Is There Discretion Present in Implementing Agency Action?

This first question addressed by this research concerns the amount of discretion present in implementing agency enforcement activities. The question of discretion is not as straightforward as one might think. The first step in determining if discretion exists is to determine if there is variation in enforcement activity. Variation is key to the idea of discretion, because if all enforcement activity is the same, both between units and across time, then the use of discretion is fairly unlikely. However, if there is evidence of

variation among cases, then the possibility of discretion remains present. While I will concede that the mere presence of variation is not, in and of itself, sufficient to determine whether or not discretion is present, it is the first step down such a road. So what of the results of the preceding study? Is there evidence of enough variation in enforcement activity to suggest discretion?

As for the existing literature on the subject of variation in enforcement activity, and subsequently on variation, the answer seems to be a resounding yes. Hunter and Waterman (1996) lay out the hypothesis for bureaucratic discretion in regulatory enforcement with their notion of “pragmatic enforcement.” While the focus of the Hunter and Waterman study was not the Office of Surface Mining, but instead the EPA and the NPDES, the authors note that this type of regulatory discretion is likely in other federal regulatory agencies, especially ones which use partial preemption as an enforcement strategy. In studies that do examine the SMCRA directly, there is also evidence which suggests that variation is present, and that bureaucratic discretion is the likely cause. In his 1989 piece, Desai finds evidence of what he calls “significant variations in the impacts of the SMCRA in six major surface coal mining states.” Likewise, Davis et al (1989) find “considerable between-state variation” in both inspections and what they refer to as “the more serious forms of enforcement activity.” While Scicchitano et al (1989) describe “substantial variation in enforcement scores.”

With all of this variation present in the existing literature, I naturally assumed that I would also find evidence of significant variation in the research conducted in this dissertation. However, what I found in my research represents what can best be

described as a mixed bag of results. As discussed in Chapter IV, the questions of discretion being present, and discretion being present at the state level are very hard to separate. In an effort to do so, I will discuss the comparative method case study evidence between coal producing regions as a proxy for the existence of discretion, and the intra-regional analysis as a proxy for state-level discretion. In terms of the inter-regional analysis presented in Chapter IV, what we see is seems to point to the existence of some kind of discretion. As for the first dependent variable examined in the study, number of inspections per mine, we see little variation between the regions. This would suggest a lack of discretion being exercised, but as stated in Chapter IV, this is hardly a surprise given that the federal government mandates a minimum number of inspections per mine, and since these inspections carry no punitive weight in and of themselves, we might not expect much variation here. The same lack of variation is evident if we examine the most punitive measure of enforcement activity, the cessation order. However, if we look at inter-regional variation for the middle measure of enforcement activity, notices of violation issued, we see that both inter-regional indicators demonstrate significant variation.

So what does this tell us concerning the use of discretion in enforcement activity? Well, it seems to suggest that the use of regulatory discretion is a possibility, but does not seem to be used as frequently as the existing literature on the subject might suggest.

What Is the Effect of Federalism on State-Level Implementation of the SMCRA?

The effect of federalism on SMCRA implementation seems to be almost a given. Once variation is found across units, and not simply across time, then evidence exists for the impact of federalism on enforcement activity. However, the question as to whether federalism has an impact on enforcement activity does not address the subtleties of how the states can manipulate enforcement of federal regulatory programs, or if they are even choosing to do so. As discussed in Chapter II, as well as in the previous section of this chapter, the existing literature seems to paint a picture of the widespread use of discretion in state-level implementation of federal regulatory activity (Woods 2003; Thompson and Scicchitano 1986; Desai 1989b; Davis et al 1989; Scicchitano et al 1989; Harris 1989). In terms of my own analysis, the findings are not as strong. In terms of the comparative method case study analysis section of this research, there seems to be significant variation in all enforcement activities, except for the measure of number of inspections per mine in the eastern region, but as we have already stated, this is not much of a surprise. These findings, along with the findings of the existing research seem to present a fairly strong case the state-level variation in the implementation of the SMCRA.

However, the evidence provided in the preceding studies all focuses on either a single year of enforcement activity across a broad number of states, or on a significant number of years of enforcement activity in a limited number of states. As such, the original argument concerning the value added by this dissertation was that it would be a complete examination of all coal producing states across the first twenty years of

SMCRA implementation. That said, in this research I include all available data for all coal producing states. This effect of this decision may have revealed itself in the pooled time series analysis. When we examine the models presented in the pooled time series analysis section of the dissertation, the findings are not as strong. These models will be discussed at length in the next three sections of this conclusion, but the first thing that I notice is that all of the models are suffering from a low r-squared. While this finding normally wouldn't concern me too much, the fact that my models are explaining very little of the variation causes me to consider two alternatives. The first is that maybe I missed the boat completely when it comes to the factors which may affect state-level implementation of the SMCRA. While that is certainly a possibility, I wouldn't classify it as a probability given the inclusion of many of these variables in the existing literature. The second, and I think more likely possibility, is that there may not be much variation left in the large pools of data examined. What I mean by this, is that by including all coal producing states for all of the first twenty years of implementation, I may have overwhelmed the variation that exists, by including cases where there is no real expectation of the use of significant discretion.

How Do Political Forces Affect State-Level Implementation of the SMCRA?

Since I study political science, the question of the effect of political forces on state-level implementation of the SMCRA seems to be of particular relevance. The question of how political forces affect regulatory enforcement is not as straight-forward. Political forces can encompass many things. If a particularly salient political figure,

suggests changes in implementation strategy, is that politics affecting implementation? Do stated party preferences of the majority party in the state affect implementation? What about cases of divided government? What about the policy preferences of the citizens? What about national level politicians? Can they have an effect? The answer to all of these questions, and some others, is yes. So how did I look for evidence of political factors influencing implementation in this dissertation?

The case for the variables of interest that were included in my models has been made variously in the preceding chapters of this research, but a simple synopsis of my method is that I conducted both a case-study comparative method analysis and a pooled time series statistical analysis which included measures of state government ideology and presidential party identification. In terms of the comparative method case-study analysis, only one of our two variables is of any use. Certainly, we would not expect presidential party identification to be a relevant factor in this section of the analysis, because there is no inter-state variation on this variable. This variable simply measures variation over time, so a discussion of the significance of this variable is best left to the section addressing the pooled time series analysis of the research. On the state government ideology measure, the results of the comparative method case-study analysis are not much better than no results. In the only case where we see significant variation, intra-regional variation in the east region, the state government ideology measure is significant in the opposite direction as expected.

As for the pooled time series analysis, the findings concerning the political variables of interest does not paint a much rosier picture. In terms of the state

government ideology variable, it is insignificant in all models as a determinant of the various enforcement activities available to the implementing agency. The presidential dummy variable doesn't perform much better. The only significant finding concerning presidential dummy variable is in its effect on numbers of inspections. As stated in Chapter V, this variable is significant at the .10 level, and in the opposite direction as hypothesized. This, coupled with the low r-squared of the model in question causes me to doubt how robust this relationship is.

So what about the indicators of political influence on state-level implementation? Well the analysis seems to attribute no impact of the political variables of interest on enforcement activity. Does that mean that there is no political impact on variation of state-level enforcement of the SMCRA? Not necessarily. The variables of interest presented in the next two sections can also measure the impact of "politics". Perhaps there is better news there.

How Do Economic Factors Affect State-Level Implementation of the SMCRA?

As important as, and perhaps intertwined with the political factors which affect state-level implementation of the SMCRA are the economic factors. It is a common theme in political science to attribute political significance to economic and market forces. In the case of the analysis presented here, economic and market forces are measured using a variable signifying the average mine-mouth price of coal and productivity measure, respectively, for each of the states included in the analysis.

The logic behind the use of these measures as possible factors affecting the regulatory activities of the state implementing agencies is fairly straight forward. Meier (1985) posits that the healthier an industry, the more likely that industry is to be heavily regulated. The idea being that healthier industries are better prepared to absorb the costs of stringent regulation, and as such, are less likely to fight regulation. As has been the case with the other hypotheses tested in this research, I subjected these variables to both comparative method case-study and pooled time series analysis.

In the comparative method case-study analysis, the variable concerning mine-mouth coal price produced no significant variation. This is not much of a surprise, because the variables used in the comparative method case-study analysis are not time series measures. As such, there is less variation in coal price between states at a given time, than there would be across time. The mine-mouth coal price could vary from state to state between regions, based upon the quality of the coal being mined, but it is much more likely for price to vary over time. The price is more likely to vary over time, as the demand for coal as a source of energy fluctuates. As is the case with the mine-mouth coal price variable, there is little in the way of expectations concerning the impact of productivity in the comparative method case-study analysis. Most of the expected variation should either be between regions, or over time. Perhaps the pooled time series analysis will produce different results.

In terms of the pooled time series analysis presented in Chapter V, we see no significance for either of the variables presented in the model. This finding is surprising in that both the variables of interest have varied greatly over time. At the time that the

SMCRA was first implemented, the price of coal was very high, and a significant amount of coal was still being mined using traditional deep-shaft mining techniques. Over the time period of the study, the price of coal dropped precipitously, and the main method of extraction shifted significantly to surface mining techniques. However, this change did not produce significant results in the pooled time series analysis. Does this mean that economic and market forces have no impact on implementation of the SMCRA?

How Does Participation Affect State-Level Implementation of the SMCRA?

I must admit that of all the questions examined in this research, the most intellectually significant for me, was the effect of participation within the policy arena on implementation of the SMCRA. As my approach to this research question was based on a foundation of regulatory policy, the variables which represent the relative strengths of the competing interests were of particular relevance to me. The logic behind the hypotheses presented in this section is that dominance in the policy arena of one of the competing interests would produce regulation that benefited that interest, while competition between the interests would produce more neutral regulatory enforcement.

In both the comparative method case-study analysis and the pooled time series analysis, the measures of enforcement activity were compared to the variables representing the relative strength of each of the competing interests within the policy arena. When it comes to the competing interests in the policy arena, they can generally be stated as the coal industry and its supporters on the one side, and the environmental

lobby and their supporters on the other. If we are able to show evidence of domination of one group over the other, then we should expect regulation to benefit the dominant group. The problem which has arisen in the research has been how to measure the relative strength of each of these groups. One of the groups, the coal industry and its supporters, is not very difficult to measure. The variable which was chosen was the percent of each states' gross state product (GSP) that is attributable to coal as a resource. The logic being, that the more dependent the economy of a state on coal, the stronger the coal industry is likely to be politically within that state. A strong coal industry would then be more likely to receive beneficial regulation, if it was not opposed by an equally strong environmental lobby.

The second measure proved to be much more difficult to quantify. My initial reaction was to use some sort of membership data for a single or group of environmental interests within each state. One of the problems with this measure is that membership data for the groups is not necessarily indicative of group strength, or of the groups position concerning coal mining. As such, the measure which was chosen was the average League of Conservation Voter score of the congressional delegation representing each state. This measure was thought to be superior, because it took into account the main factor concerning political power, the ability to persuade the politically relevant actors.

In the comparative method case-study analysis of the variables of interest, some interesting results were found. In each of the two regions, the states fell neatly into one of two groups, the pro-industry states and the pro-environment states. The analysis

demonstrates that the pro-environment states—Montana and Ohio—produce a much more stringent level of regulatory enforcement than the pro-industry states—Wyoming and Kentucky. While this finding is of interest, it is not that surprising given that the states to be included in the comparative case-study section of the analysis were hand chosen because of the characteristics that they demonstrate. Any generalizability concerning the results would be left to the pooled time series analysis.

The pooled time series analysis is where the argument begins to unravel. A review of the examination presented in Chapter V shows a negative and significant relationship between percentage of state GSP attributable to coal and number of inspections per mine. This relationship doesn't bother me too much intellectually, because it is easy to imagine a state with a strong coal industry encouraging inspections without further punitive action. However, the relationship becomes insignificant when applied to the more stringent measures of enforcement activity. The examination of the relationship between the measure of environmental group strength and regulatory enforcement produces equally unsatisfying results. A review of the analysis presented in Chapter V shows that the coefficient for the LCV score is positive, but insignificant in terms of inspections per mine. Examination of the other three models shows a significant and negative relationship for notices of violation per mine $(-0.029)^{19}$ and cessation orders $(-0.048)^{20}$, but an insignificant positive relationship for notices of violation per inspection.

¹⁹ Presented in Table 5.2

²⁰ Presented in Table 5.5

So what does this tell us? Simply, it says that the relationships that are significant are either not in the expected direction, or canceled out by results presented in the same model. This finding, couple with the fact that the models do not offer much in the way of r-squared, indicated that any variation present within the data is not being well represented by the models. So the next question is, why not?

Conclusions and Implications for Future Research

So what does all of this mean? Well, there is little doubt that the results of the analysis presented in this dissertation raises as many questions, or more, than it answers. It would be easy to dismiss the relationships indicated in the analysis as insignificant, since most of the coefficients are just that, but does that mean that nothing can be learned from the analysis presented in the preceding dissertation? I certainly don't think so. Just because I have null findings in the case of the statistical analysis of this dissertation, it does not mean that I have found nothing. In terms of the analysis, I think that there are a couple of things which can be of theoretical use, and I also think that I made some mistakes along the way. I will start with the positive first.

In terms of what can be learned from the analysis, I think that the answer is pretty clear. At every stage of the analysis, I was able to provide evidence which suggested that the use of discretion in implementing agency action was possible. Whether we are talking about political, economic or market forces, or the effect of competition within the policy arena, I think that there is plenty of anecdotal evidence to suggest that implementing agents are subject to outside influence, and can use discretion under

certain circumstances. However, this evidence seems to disappear when we subject the data to more rigorous statistical examination. This could be taken to mean that the anecdotal evidence is simply smoke and mirrors, the proverbial welfare Cadillac. I don't happen to believe that interpretation. The existing literature on the subject of SMCRA enforcement (Hedge and Scicchitano, 1994; Woods 2003; Thompson and Scicchitano 1986; Desai 1989b; Davis et al 1989; Scicchitano et al 1989; Harris 1989), as well within the field of regulatory policy generally (Wood and Waterman, 1994; Keiser and Soss, 1998; Scholz and Wood, 1998; Ringquist, 1993; Wood and Anderson, 1993; Wood, 1992; Scholz, Twombly, and Headrick, 1991; Thompson and Scicchitano, 1985; Langbein and Kerwin, 1985) is filled with evidence of political, economic, and competitive forces having an impact on regulatory enforcement. So why is this analysis different?

I think that this analysis produces different results for a couple of reasons. In terms of the existing literature on SMCRA enforcement, the scope of the analysis presented in this dissertation is much larger than what is presented in previous studies. As said before, most of the existing literature on SMCRA enforcement either looks at a small number of states over a short period of time, or looks at all states over a single cross-section of time. This analysis looks at all coal producing states for the first twenty years of SMCRA enforcement. In terms of why this analysis produced different results from the existing literature in the field of regulatory policy generally, I think that the answer lies in the nature of the coal industry itself. The coal industry in many areas has

become less and less important, and has in effect become politically irrelevant over time. As such, it has become a different animal than most other federal regulatory programs.

It seems to me that what is truly happening here is that there is less and less reason for an implementing agent to exercise discretion in terms of SMCRA enforcement. The vast majority of states which produce coal, produce it in such an insignificant amount that there is no real pressure being applied. In states where a significant amount of coal is being produced, there is often true competition within the policy arena, which also produces neutral regulatory enforcement. The classic example of this case would be West Virginia, where the number one industry in the state is the coal industry, but the number two industry is tourism, which produces a significant environmental lobby. It is my belief, that the main reason for the lack of explanatory power demonstrated by the models is due to the fact that, by including all coal producing states, the variation which might have been attributed to the variables of interest was simply overwhelmed by bureaucratic inertia. When an implementing agency is not being pressured for results, they are much more likely to produce consistent results within their own comfort zone. I feel that is what is happening in terms of SMCRA enforcement.

This rationale suggests that they may be cross-sectional factors which affect regulation which is not accounted for by the model. One possible suggestion is that some states may simply regulate more than others. The argument being that there may be a “regulatory culture” present within some states which cancels out variation based upon the other theoretical factors. In this case, it would not matter what industry we

looked at, the variation in enforcement would occur across units, and not necessarily over time. In terms of the statistical analysis presented in this dissertation, some of this variation should have been captured through the use of the Berry et al indicator of state government ideology. However, this is a less than perfect way to measure this type of unit-wise effect. Therefore, I performed a two-way fixed effects model on the data, not to see the effect on the coefficients, but simply to see if the states grouped in any significant way. Analysis of the two-way fixed effects model seemed to indicate that the states fell into one of three groups. A number of states simply dropped from the model in the fixed effects analysis. These states were primarily the states which do not produce much coal, among them were; Alaska, Arkansas, California, Georgia, Iowa, Kansas, Louisiana, Maryland, Missouri, Oklahoma, Tennessee, and Washington. This seems to indicate, that in states which do not produce any significant amount of coal, there is no reason to expect political, economic, or competitive forces to have any impact on enforcement activity.

The remaining states fall into one of two groups. The first group produces significant negative coefficients in the fixed effects model, and while I can draw no real leverage from interpreting the coefficients, the group does share a common characteristic. Most of the states in this group are large eastern coal producing states. Included in this group are Indiana, Kentucky, Ohio, Pennsylvania, Virginia, and West Virginia, along with the seeming outliers, Alabama and Colorado. The second group of states were those which produced significant positive coefficients in the fixed effects model. While this group is not as uniform as the first, it also produces an interesting

group of shared characteristics. This group includes the major coal producing states of the western region—Montana and Wyoming—along with some other states from the western region—New Mexico, North Dakota, and Texas. The only real outlier in this group was Illinois, which produces a significant amount of coal, but would seem to fit in better with the first group. So what does this tell us? I gain a couple of insights from this analysis. First, perhaps it is best to exclude states which do not produce a significant amount of coal from the model. It may be that the statistical significance in the model is lost due to the clutter produced by the inclusion of non-relevant states. Secondly, it may suggest that inter-regional variation is so significant, that regulation in the eastern states cannot be adequately compared to variation in the western states. While the inclusion of the percent of coal mined through surface mining variable should have given me some leverage on this phenomenon, perhaps it would be better to group the states based upon coal producing region.

As for potential mistakes made along the way, I think that the top of the list is reserved for the decision to include all coal producing states across the first twenty years of SMCRA enforcement. While that decision was made to be more intellectually satisfying and thorough, the end result seems to have been to overwhelm the variation which might have existed. As noted in the earlier sections of this dissertation, most of the existing literature in the field either looks at a small number of significant coal producing states over time, or focuses on a large number of coal producing states for one year. Secondly, I think that the analysis suffered by not being able to find a variable which captured the nuances of the environmental lobby within each state. Being pro-

environment doesn't necessarily mean being anti-coal, especially in states which produce an insignificant amount of coal. Lastly, I think that I may have been influenced by my background to be too limited in my thinking. To illustrate this point, I look to the research of Neal Woods. Not to say that this research is superior to the analysis conducted here, but to illustrate that each of us is tainted by our preconceptions. In Woods (2003) research, the focus is not on competition between competing interests within the policy arena, as is mine, but instead on the structure of bureaucratic institutions. This discrepancy stands to reason. Just as I was influenced by my regulatory policy background, I think that Woods research is influenced by his institutional background, and as such, I think that there is something that may have been missed along the way.

So now that I am at the end of this research, what is my impression? I feel that I have learned much in the process, not just about coal mine regulation, but about the process of research in general. As the old saying goes, "if the numbers always turned out how we wanted them, there would be no sense in doing the research."

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